

# MOTOR AGE

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## NEXT WEEK

"How Motor Trucks Saved Verdun," the feature of Motor Age for July 19, gives you an insight of how the French met and defeated the Germans against odds and details the probable result had not motor equipment been available. Read W. F. Bradley's story next week

# "NORMA"

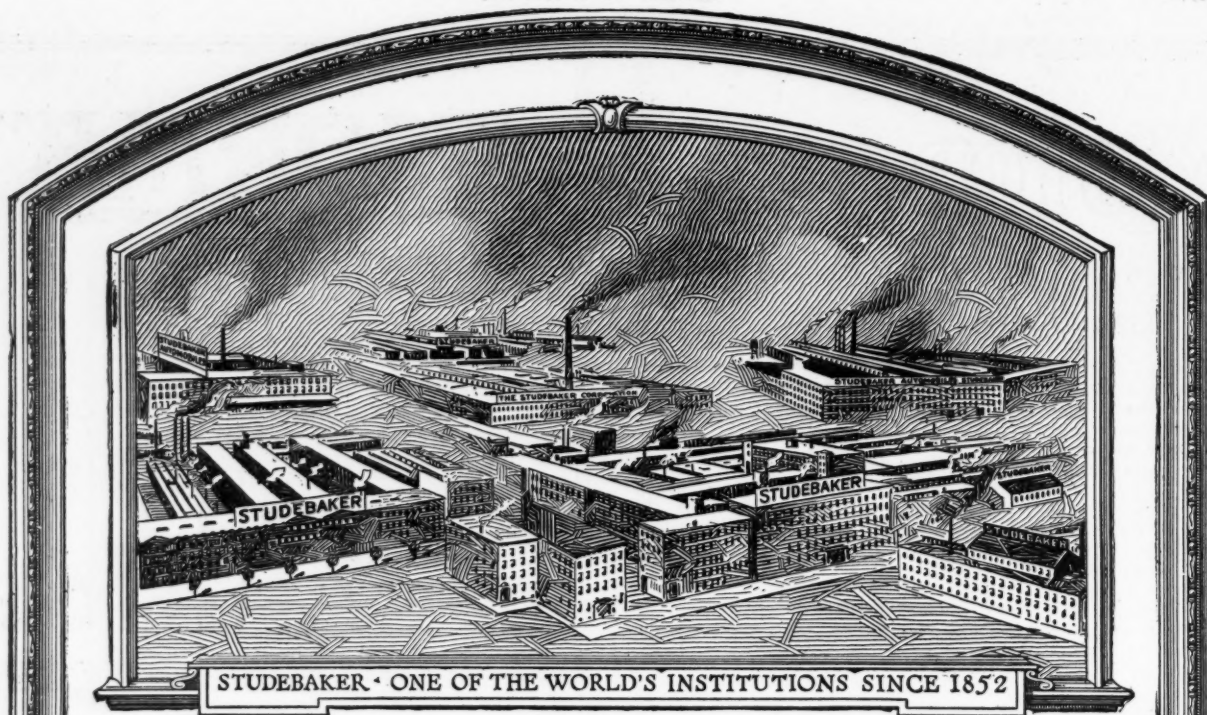


## BALL BEARINGS

From the standpoint of comfort, pleasure and serviceability, your car is no better than its ignition apparatus and its lighting generator. Its performance is made or marred by the performance of these accessories. Realizing this, the makers of magnetos and generators whose names stand for service and satisfaction have safeguarded their customers against bearing failures by equipping their machines with "NORMA" Ball Bearings. The results have been highly gratifying, alike to accessory builder, car manufacturer and car owner.

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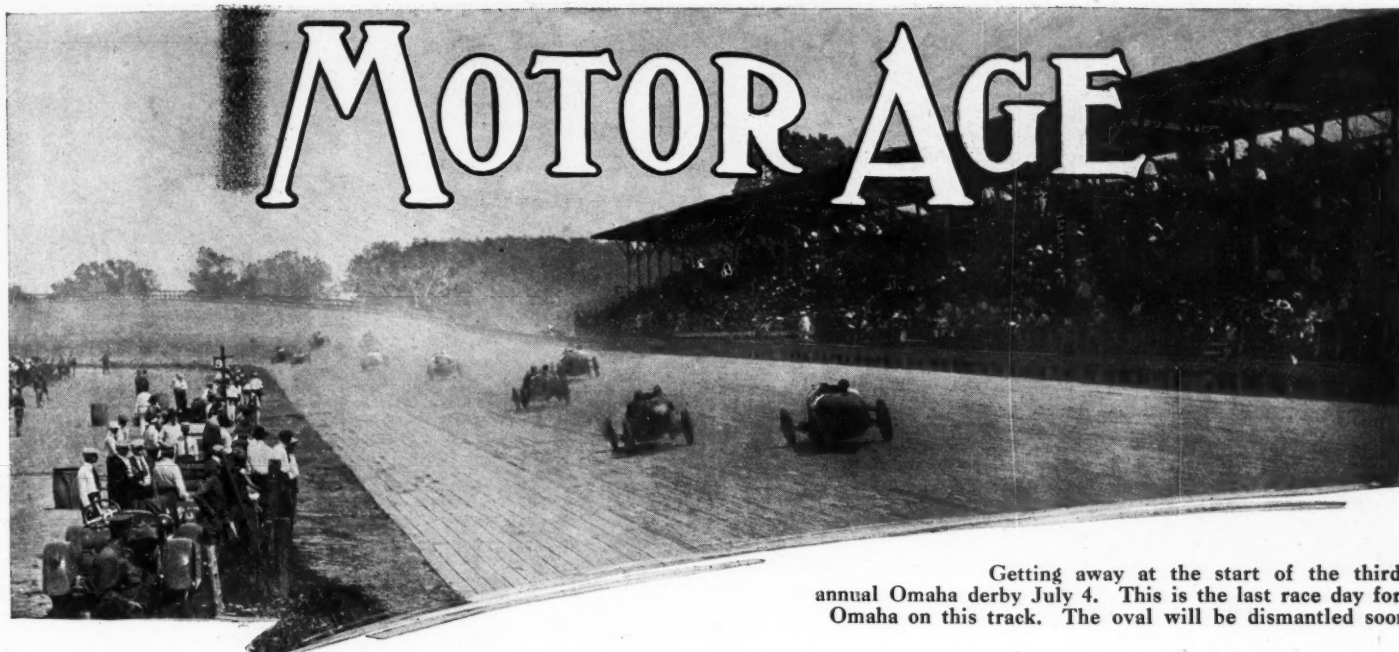


Studebaker dealers have behind them all the benefits of the knowledge accumulated by Studebaker through 65 years of successful manufacturing experience—and the resources of one of the world's greatest manufacturing institutions.



It pays to be a *Studebaker* dealer





Getting away at the start of the third annual Omaha derby July 4. This is the last race day for Omaha on this track. The oval will be dismantled soon

## Mulford Wins the Last Omaha Derby

Forces Hudson Hard and Is Victor Over Milton's Duesenberg  
by Narrow Margin—Track Disintegrates and Is Dangerous

### How They Finished and What They Got

Car	Driver	Time	M. P. H.	Purse
Hudson	Mulford	1:28:53.00	101.40	\$3550†
Duesenberg	Milton	1:29:57.07	100.05	1700*
Mercer	Thomas	1:30:18.20	99.66	1000
Duesenberg	Hearne	1:31:21.28	98.52	800
Hudson	Taylor	1:31:27.69	98.41	700*
Mercer	Haines	1:31:36.28	98.25	500
Hoskins	Lewis	1:34:35.69	95.16	300
Miller	Burt	1:37:44.60	92.40	....

†\$350 for finishing first with A-C plugs.  
\*\$100 for finishing with A-C plugs.

By William K. Gibbs

OMAHA, Neb., July 5—Driving a track that disintegrated more and more with every circuit until at the end it bore a striking resemblance to some of the wreckage of European battlefields, Ralph Mulford piloted his Hudson Super-Six to victory in the 150-mile valedictory race on the



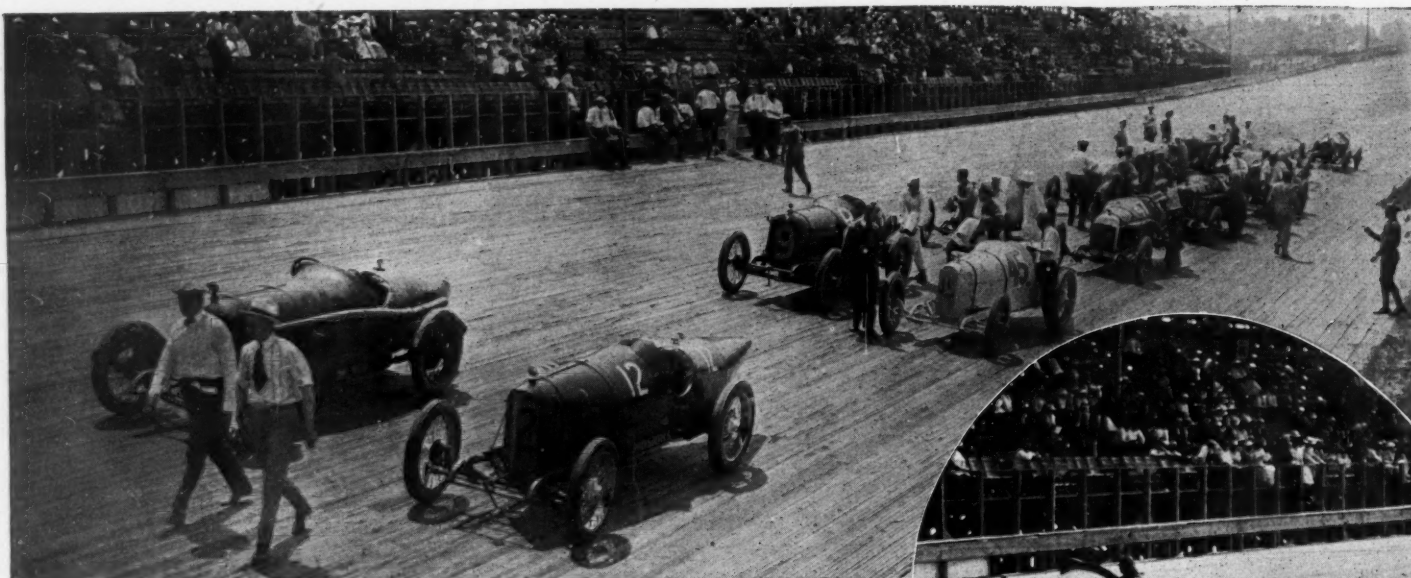
Below—Lineup of officials, drivers and mechanics for the third annual Omaha race, run July 4, 1917



Omaha 1¼-mile speedway yesterday afternoon, maintaining an average pace of 101.4 m.p.h., and nosing out Tommy Milton's non-stop Duesenberg by seconds. Ralph came into the pits twice for tires at a time when it looked as if his ill-luck of last year when he fought a stiff battle with Resta was about to be repeated, but his total time at the pits was only 55 sec. It was a Garrison finish, only 2 min. and 43 sec. separating the first six to cross the tape.

Mulford was the only one who did not suffer a change from the flag finish when the timing tape was checked last night. Immediately after the last car was off the course, Manager Martin of the Mercer team declared that Thomas' Mercer finished first and Haines' Mercer second and that in his opinion Milton's Duesenberg beat Mulford. However, Mulford was first to get the flag and the others were flagged in this order: Mulford, Hudson; Thomas, Mercer;

Left—Ralph Mulford, victor in the third and last race to be held on the Omaha 1¼-Mile Speedway



Line up of cars just before start of 150-mile race

### Finish Times and Prizes in 50-Mile Event

Car	Driver	Time	M. P. H.	Purse
Hoskins	Lewis	29:03.00	102.85	\$1000
Hudson	Mulford	30:12.45	99.31	500
Duesenberg	Milton	30:14.10	99.22	300
Duesenberg	Henderson	30:14.50	99.20	200
Hudson	Taylor	30:14.85	99.18	.....

Haines, Mercer; Milton, Duesenberg; Hearne, Duesenberg; Lewis, Hoskins; Burt, Miller Special; Taylor, Hudson. A check of the timing tape placed the cars and drivers as follows: Mulford, Hudson, first; Milton, Duesenberg, second; Thomas, Mercer, third; Hearne, Duesenberg, fourth; Taylor, Hudson, fifth; Haines, Mercer, sixth; Lewis, Hoskins, seventh and Burt, Miller Special, eighth.

#### Charges of Favoritism

Vitrolie charges were made against the timer and the writer that ranged from the payment of money to throw the race, to that of being on the payroll of the Hudson company. This came about, very likely, through an expressed desire on the part of those checking the times to be undisturbed until the check was finished. There was no trouble with the timing, but the scoring was bad. Had the scorers been efficient there would have been no misunderstanding in flagging the cars. The manager of the Mercer team to-day declared he would protest on the ground that Mulford had six men working on his car at one time. Photographic evidence showed two of the six men seen about Mulford's car at the time of his second tire change to be a member of the technical committee and the A.A.A. representative.

That only five cars were docked during the race and one wrecked indicates that Fate sometimes is kind to race drivers. That the track was to be dismantled after the Fourth of July races was announced in *MOTOR AGE* last week. A couple more race days like yesterday would come near to an automatic dismantling of the course.

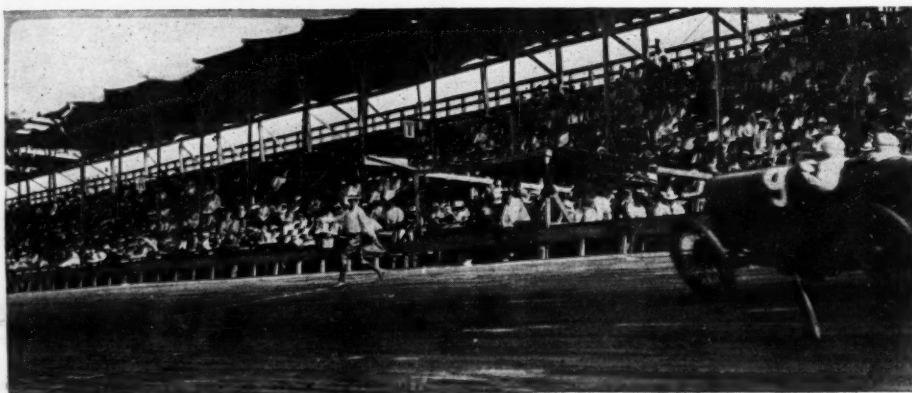
Built of inferior material, the Omaha track showed signs of disintegration last year—it was then only a year old—and although the numerous ruts that were present a year ago had been filled with cement and asphalt, the elements had worked havoc with numerous other places in the course and holes developed early in yesterday's main event. Many of the drivers were bruised by flying pieces of two-by-fours and to-day are picking slivers of wood from their hands and bodies.

When the 150-mile race was about two-thirds over a hole developed in the track just in front of the finish line. Starter Wagner stood out in the middle of the track with a yellow flag to warn drivers of their danger and later a yellow flag was set up to indicate the hole. This is shown in some of the illustrations. An examination of the course after the main event showed

Starter Fred Wagner holding yellow flag over bad hole in track

the hole near the finish line to be of little consequence compared with those on the back stretch and in the turns. Louis Chevrolet told the writer that there were places in the back stretch where two-by-fours protruded from the track 2 ft. during the race and that it was the dropping of one of his wheels into a rut that broke his axle shaft and forced him to withdraw. The second race of the afternoon was held an hour and a half to allow a score of carpenters to rebuild parts of the course.

Now for the race itself. Mulford drove the 150 miles in 1 hr. 28 min. and 53 sec., for an average speed of 101.4 m.p.h. However, it was Louis Chevrolet who showed the way until he went out in the fifty-seventh lap. He was closely seconded by



Ralph Mulford getting the flag at the finish. Note flag beside car, which marks a hole in the track



## Time of Finishers Each Ten Laps in 150-Mile Race at Omaha July 4

No.	Car	Driver	10	20	30	40	50	60	70	80	90	100	110	120
9	Hudson	Mulford	7:21:55	14:37:05	21:49:20	29:00:00	36:15:35	44:20:45	51:32:90	58:43:43	1:05:55:95	1:13:15:70	1:21:39:80	1:28:53:00
7	Duesenberg	Milton	7:35:55	15:00:70	22:28:55	29:55:05	37:24:30	44:50:60	52:58:40	59:51:38	1:07:23:00	1:14:55:40	1:22:23:00	1:29:57:07
46	Mercer	Thomas	7:20:95	14:36:60	21:55:10	29:23:45	36:59:40	44:32:50	52:02:75	59:38:88	1:07:10:20	1:14:46:38	1:22:25:00	1:30:18:20
45	Duesenberg	Hearne	7:26:45	14:40:48	21:56:78	30:15:18	37:13:78	45:48:80	53:20:30	1:00:56:28	1:08:20:15	1:16:04:44	1:23:46:90	1:31:21:28
44	Hudson	Taylor	8:02:95	15:43:90	23:25:10	31:01:30	38:37:90	46:12:25	53:48:85	1:01:20:85	1:08:55:85	1:16:29:20	1:23:58:05	1:31:27:69
48	Mercer	Haines	7:28:20	14:38:40	21:59:40	29:16:65	36:51:60	44:22:45	53:02:05	1:00:14:70	1:09:13:35	1:16:46:18	1:24:09:83	1:31:36:28
12	Hoskins	Lewis	7:22:76	14:37:60	23:31:25	30:55:60	40:16:80	50:02:73	57:23:92	1:04:56:50	1:12:20:75	1:19:36:00	1:27:03:65	1:34:35:69
55	Miller	Burt	8:22:00	16:30:00	24:26:45	33:03:55	41:23:30	49:39:30	57:52:15	1:05:52:78	1:13:52:48	1:21:54:60	1:29:52:90	1:37:44:60
54	Frontenac	Chevrolet	7:11:15	14:18:60	21:26:55	28:21:05	35:04:45	Out						
51	Frontenac	Kirkpatrick	7:13:35	14:21:00	21:31:30	28:46:05	36:47:20	46:15:75	53:26:90	1:00:04:30	1:10:43:05	1:19:12:95	Out	

Kirkpatrick in the second Frontenac during the first part of the race. Chevrolet was doing laps at 111 m.p.h. and easily showed the best speed of any car on the course. The cars were sent away at 2 o'clock with Chevrolet at the pole and Kirkpatrick's Frontenac beside him. The others were lined up two abreast as follows: Lewis' Hoskins and Thomas' Mercer, second row; Hearne's Duesenberg and Mulford's Hudson, third row; Alley's Pan-American and Milton's Duesenberg, fourth row; Henderson's Duesenberg and Haines' Mercer, fifth row; Mason's Ogren and Taylor's Hudson, sixth row; Toft's Omar and Burt's Miller, seventh and McBride's Olsen special in the last row.

### Alley's Pan-American Wrecks

The cars got away to a false start and had to be flagged down and another trial made. This time the cars were fairly well bunched and Wagner gave them the flag. Chevrolet and Kirkpatrick thundered across the tape in the lead and simultaneously Alley's Pan-American was seen to dart swiftly from its position on the inside of the track on the turn into the home-stretch, go about two-thirds of the way to the outer rail, then veer sharply back across the track, strike the dirt at the edge of the apron and turn two complete somersaults, Alley and his mechanic, Billy Salmon, being hurled through the air and out of the way of the machine on the first of its double flipflop.

Lap after lap Chevrolet shot his Frontenac across the line, doing well up around 110 m.p.h., while Kirkpatrick was close on his heels in the second Frontenac. They held first and second place in the tenth, twentieth, thirtieth and fortieth laps and Chevrolet led at fifty laps, going out in the fifty-seventh with a broken axle shaft when he was leading the field. Joe Thomas' Mercer was playing for third place early in the race and eventually finished there, although Mulford's Hudson and Milton's Duesenberg passed him and took first and second places after Chevrolet and Kirkpatrick relinquished their hold on these coveted positions. Dave Lewis had his Hoskins going in fine shape and looked like a real contender until several tire changes dropped him down to seventh place at the finish.

Mulford passed Thomas on the twenty-seventh lap, going into third place, while Eddie Hearne pushed his Duesenberg into fifth position. Neither Milton, Thomas,

nor Billy Taylor, who finished fifth, made a stop during the race. Dave Lewis was the first to stop at the pits. Hearne visited the pits in the thirty-seventh lap, but was away again in 23 seconds, while Mason's Ogren and Toft's Omar were docked at the same time, the former with a broken radiator and the latter a broken crankshaft. Spectators thought the Omar was to repeat the performance of the Burman Special driven by Jack Gable last year. It was seen to leave the track at the turnout of the home stretch, but stayed right side up and later was found to have been purposely driven off the course when Toft found his engine disabled with a broken

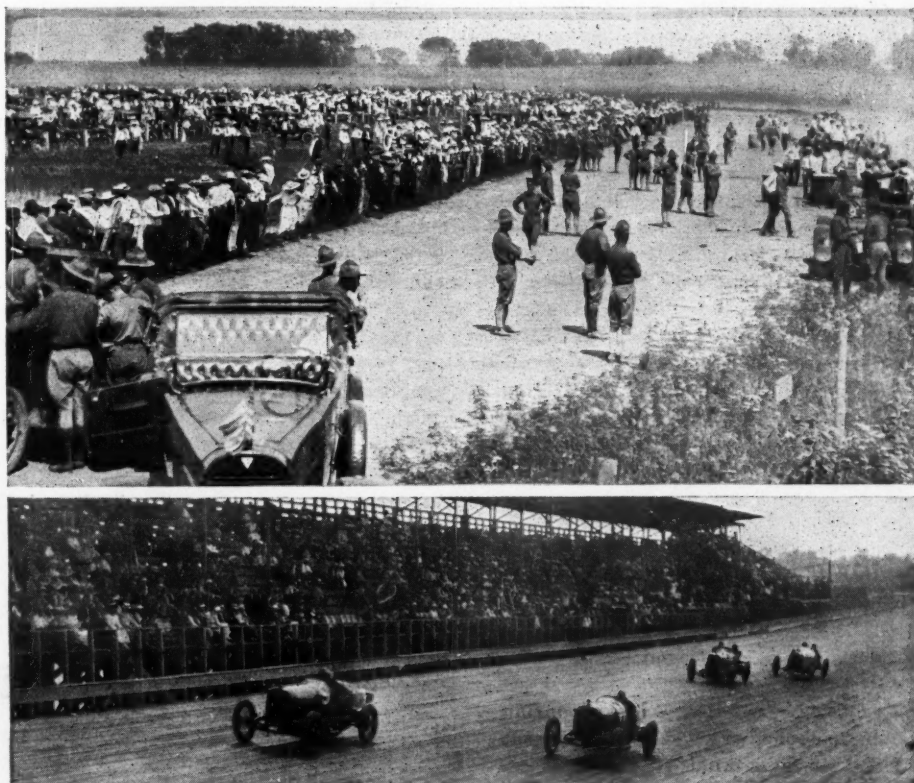
crankshaft. The speed at which it left the course made it appear accidental.

Kirkpatrick's Frontenac cast the tread of a right rear tire when the race was practically half over. This occurred in front of the pits and meant a slow lap for him. Chevrolet relieved Kirkpatrick at the next time around and after changing plugs went into the race and drove like mad to place the car in the money, but was out almost when he had a chance in the first four positions, with a broken waterjacket.

Mulford jumped into the lead as Chevrolet dropped out and checking of the timing tape showed that he never left that position. By consistent driving he gained

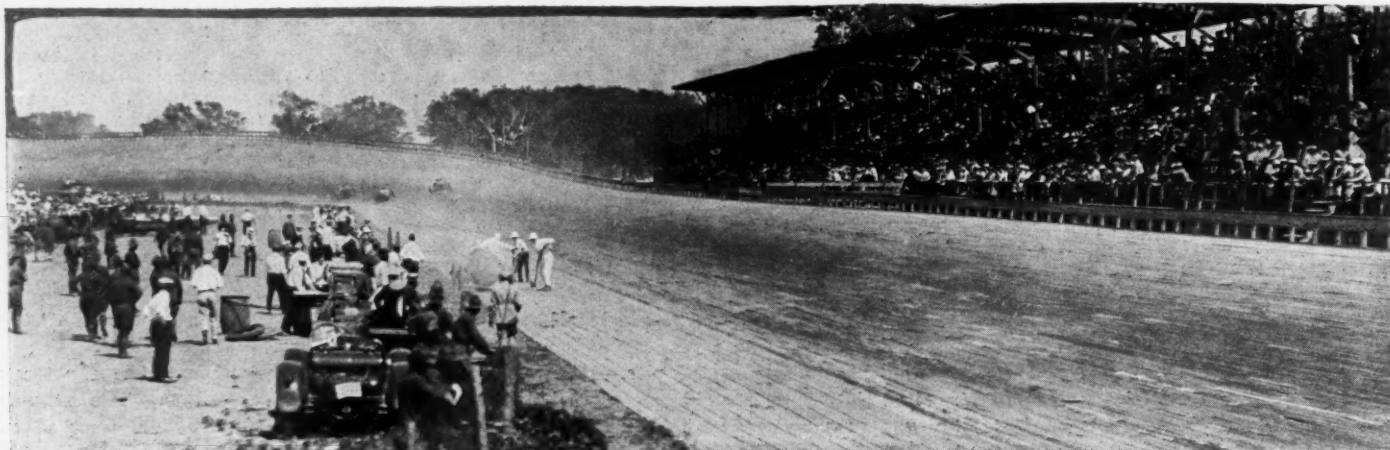
## Times Each Ten Laps in 50-Mile Omaha Race

50 MILE RACE														
No.	Car	Driver	10	20	30	40								
12	Hoskins	Lewis	7:09:25	14:24:75	21:12:80	29:03:00								
9	Hudson	Mulford	7:42:30	15:44:95	22:58:40	30:12:45								
7	Duesenberg	Milton	7:37:40	15:12:10	22:04:85	30:14:10								
8	Duesenberg	Henderson	7:37:90	15:11:55	22:04:40	30:14:50								
44	Hudson	Taylor	7:45:30	15:14:20	22:42:45	30:14:85								



Above—A view of the pits, showing infield crowds. This indicates guard formation. Soldiers were present but ineffective in keeping crowd under control when Alley's accident happened. Below—Mulford and team mate Taylor in Hudsons in brush in front of stands closely followed by Thomas Mercer and Milton's Duesenberg





Mulford in first of his two tire change stops. This gives an idea of the grandstand crowd

slowly but steadily and when he was forced into the pits late in the race for a tire change that took 34 seconds, he had a two-lap lead and was not headed.

In the second race of the afternoon Dave Lewis in his Hoskins showed the way to the field at the average pace of 102.85 m. p.h., doing the distance in 29 min. and 3 sec., just a shade slower than Ralph de Palma did last year in his Mercedes, when he drove the fifty miles at a little over 103 m.p.h., and for which he was given a world's record for 50 miles on a 1¼-mile track. At ten, twenty and thirty laps Lewis was averaging from 103 to 105 m.p.h., but in the last ten seemed to conserve his car and slowed up slightly which brought his general average down.

#### Hold Race; Repair Track

The second race to-day was held from 4 o'clock until 5:30 so that the track might be repaired. This was the latest a race has been started in many months, according to Wagner. Bad luck again jinxed Chevrolet in the 50-mile race. He had taken an axle shaft from his teammate's car and put his own Frontenac in condition for the second race. He fought Lewis a hard battle for the first 15 miles and then came into the pits. Hopelessly outdistanced after the pit stop, he went back in and drove like a fiend, several of his laps being clocked at 114 m.p.h., which is fast for this size track and especially in the condition that it was left in after the first race. The pace he



Chevrolet's Frontenac leading the field with the second Frontenac holding second place

set never has been equaled on the Omaha track.

Only ten started in the 50-mile event, the two Mercers staying out, even though finishing in the money in the big event. Thomas claimed his car was not in condition and Haines claimed clutch trouble. There may have been a little peevishness current on account of the results of the first race. Hearne, Burt and Mason dropped out of the 50-mile race shortly before the finish. Lewis did not stop but Mulford came to the pits once, and finished second

with Tommy Milton and Pete Henderson close behind. There were only four moneys in this event and although Taylor brought his Hudson across the line a close fifth he was outside the prize money. Only three-quarters of a second separated Milton, Henderson and Taylor at the finish of the 50-mile event and one wave of the checkered flag served for all.

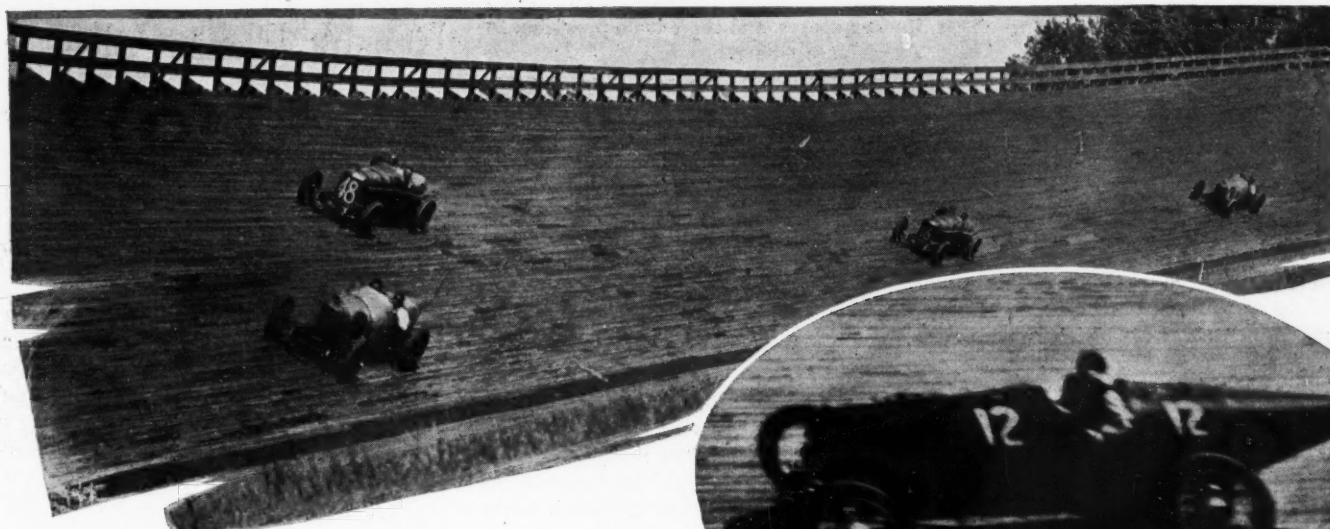
Attendance to-day was approximately 20,000, being about equally divided between the grandstand and the infield. Only eleven casings were changed in the 150-mile race,

### Equipment of All Cars Starting in July 4 Events at Omaha

No.	Car	Driver	Bore	Stroke	Cyl.	Loca- tion	Igni- tion	Plugs	No. Plugs	Carb.	Tires	Size	W.B.	Lub.	Motor	Wheels	
54	Frontenac ....	Chevrolet ..	3,780	6,375	Blk.	16	Head	Bosch	K.L.G.	4	Miller	Goodyear	33x5	104	Oilzum	Boyce	R-W
51	Frontenac ....	Kirkpatrick.	3,780	6,375	Blk.	16	Head	Bosch	Rajah*	8	Miller	Goodyear	32x4½	104	Oilzum	Boyce	R-W
46	Mercer .....	Thomas ...	3,875	6,375	Sep.	16	Head	Bosch	Rajah	8	Miller	Goodyear	33x5	108	Oilzum	Boyce	R-W
48	Mercer .....	Haines ....	3,875	6,375	Sep.	16	Head	Bosch	Rajah	8	Miller	Goodyear	33x5	108	Oilzum	Boyce	R-W
12	Hoskins .....	Lewis ....	3,750	6,750	Blk.	16	Head	Bosch	Rajah	8	Miller	Goodyear	33x5	105	Oilzum	Boyce	R-W
45	Duesenberg ...	Hearne ....	3,750	6,750	Blk.	16	Head	Bosch	Rajah	8	Miller	Goodyear	34x4½	106	Oilzum	Boyce	R-W
7	Duesenberg ...	Milton ....	3,750	6,750	Blk.	16	Side	Bosch	A.C.	8	Miller	Goodyear	34x4½	106	Oilzum	Boyce	R-W
8	Duesenberg ...	Henderson..	3,750	6,750	Blk.	16	Side	Bosch	A.C.	8	Miller	Goodyear	34x4½	106	Oilzum	Boyce	R-W
55	Miller .....	Burt .....	3,625	7,000	Blk.	16	Head	Miller	A.C.	8	Miller	Goodyear	34x4½	104	Castor	Boyce	R-W
9	Hudson .....	Mulford ....	3,500	5,000	Blk.	12	Side	Delco	A.C.	6	Hudson	Goodyear	33x5	107	Oilzum	Boyce	R-W
44	Hudson .....	Taylor ....	3,500	5,000	Blk.	12	Side	Delco	A.C.	6	Hudson	Goodyear	33x5	107	Oilzum	Boyce	R-W
29	Omar .....	Toft .....	3,750	6,750	Blk.	16	Side	Bosch	Rajah	8	Miller	Goodyear	34x4½	106	Oilzum	Boyce	R-W
47	Pan-American.	Alley .....	3,625	7,000	Blk.	16	Head	Bosch	Bosch	8	Miller	Goodyear	34x4½	106	Castor	Boyce	R-W
49	Olsen .....	McBride .....	.....	.....	Sing.	16	Head	Bosch	Affinity	8	Miller	Goodyear	34x5	107	Oilzum	Boyce	R-W
52	Ogren .....	Mason .....	3,625	7,000	Blk.	16	Head	Bosch	Rajah	8	Miller	Goodyear	33x5	109	Oilzum	Boyce	Houk

\*4 Special. All cars were equipped with Hartford shock absorbers.

\*4 Special. All cars were equipped with Hartford shock absorbers.



Henderson's Duesenberg, Haines' Mercer, Thomas' Mercer and Milton's Duesenberg on the west turn. In oval—Dave Lewis doing over 100 m.p.h. in the 50-mile event

which spoke well for cord tires when the heat of the day and the condition of the track was considered.

Only ten stops at the pits were made by the cars that did not fall by the wayside. Mulford made two, changing a right rear one time and a left rear the other. His total time at the pits was 55 sec. Milton did not bring his Duesenberg to the pits during the race. Dave Lewis made the most stops of any driver to finish—three—all for tires, three right rears and one left rear. Thomas' Mercer also went through without a stop, although the other Mercer made stops, both for right front tires. Eddie Hearne came in once for a right rear, Taylor's Hudson duplicated the feat of Milton and Thomas by going through on the same casings.

Peter Henderson went out in the forty-fifth lap with a broken radiator, Toft's Omar was out in the thirty-ninth lap with a broken crankshaft, Chevrolet went out in the fifty-seventh with a broken axle shaft, and Kirkpatrick stopped once for a right rear, once when Chevrolet took charge of the Frontenac and Chevrolet went out with the second car in the one hundred and twelfth lap with a broken water jacket.

Summed up it means that all of the stops to-day were for tires and for very few of these.

#### BUICK WINS ROAD RACE

Denver, Colo., July 5—The 131-mile road race from Denver to Laramie, Wyo., yesterday was won by Bob Murray in a Buick, in 3:09:30. Cliff Sundin in a Mercer finished second in 3:16:20, after holding the lead for the first 50 miles. George Edwards won third prize in a Thomas Flyer in 3:45:42, and the next two places went respectively to C. M. Duncan

in a Ford and L. P. Appleman in a Premier. The remaining six of the eleven cars that started failed to finish. George McDonald's Chalmers crowded the fastest time for 65 and 75 miles and was a close third when it went out with a broken axle at 100 miles. Sharp curves, steep grades, soft dirt from fresh grading at several points, a narrow canyon 40 miles from the finish and other unfavorable features made the road a difficult and risky one to drive, but also made the race the more exciting. Cars were disabled by plunging into ditches, fences and telephone poles, but the drivers all escaped severe injuries. The Premier caught fire at about 30 miles and the flames leaped to Appleman's clothing, but he avoided serious burns by stopping his car and rolling in the dust. The Mercer was ditched twice, but Sundin managed to keep it right side up and escaped wrecking it. The other entrants were a National, Hudson, Apperson, Haynes and Paige. The National was wrecked 15 miles out, and the others dropped out along the line from broken connecting rods and similar troubles.

#### STAGES STUNTS ON FOURTH

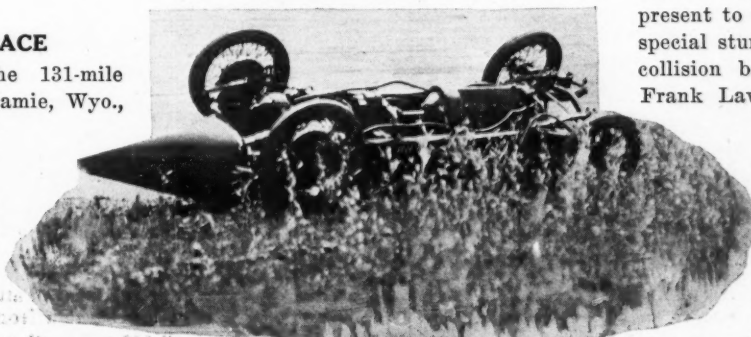
Milwaukee, Wis., July 7—Motor racing fans of eastern Wisconsin to the number of

5000 or more witnessed the program of amateur events staged at State Fair park July 4 under the auspices of the Milwaukee Automobile Racing Association. The feature of the program was a military chauffeurs' contest over four routes averaging 85 miles in length and terminating at the state fair park. At the completion of the road run, each contestant was obliged to drive 1 mile on the dirt track against time and then change one tire. The first to finish was L. Denton, driving a Chandler touring car, who started at Great Lakes, Ill., the naval training station, and arrived in 1:30. Denton made the mile time trial in 1:18½ and the tire change in 2:15, winning first money. Warner Butzon, driving an Overland, made the distance from Madison, Wis., state capitol, to the park in 2:28. Herbert Zwiebel, in a Mitchell, drove from Manitowoc, Wis., to the park in 2:04, and Frank Roesler, in a Chalmers, came from Oshkosh, Wis., in 2:34.

#### OHIO HAS FORD DAY

Columbus, Ohio, July 6—Members of the Ohio branch of the Ford family, together with their friends and relatives assembled at the Columbus Driving Park, July 4, to participate in the first annual "Ford Day." In all there were more than 4000 Fords present to witness speed events as well as special stunts. One of the features was a collision between two Fords, driven by Frank Lawwell and Harvey Edgar, two former racing drivers. The two drivers jumped to safety before the crash came. The result was two badly damaged Fords.

The 5-mile state championship race was easily won by Ben Lawwell in 5:15. The 5-mile race was also won by Ben Lawwell at 52.3 m.p.h.



Tom Alley's Pan-American on its back after doing a high dive



## Paris Motor Stores Dark

**Dealers Having Nothing to Sell  
Have No Alternative But  
to Close**

**Some Maintain Showrooms and  
Turn Them Over to Red Cross**

PARIS, June 15—About 90 per cent of the motor stores of Paris are closed. Having nothing to sell, dealers had no alternative. A certain number have maintained their showrooms and handed them over temporarily to the Red Cross and other charitable organizations; others, evidently foreseeing a long war, have relinquished their leases and the buildings are standing empty. During the last few months there has been a revival of commercial activity and enterprising firms have obtained premises in the Champs-Elysees and other parts of the motor district, with the intention of opening them as soon as the war comes to an end. Important changes in location are certain, for firms holding some of the best positions in the Champs-Elysees district have sold out, and others never having had positions there have options.

Despite the war accessory dealers are busy, their greatest difficulty being to get enough goods to meet the demand. Everywhere stocks are low, for practically nothing is being produced in France and imports are only being received from America. All goods in brass and copper have been requisitioned by the military to such an extent that it is exceedingly difficult for the ordinary person to get supplies. The increase in price on all accessories varies from 30 to 75 per cent. Spare parts are very difficult to obtain, for the factories prefer to produce airplane engines, shells or complete cars, rather than parts. The army motor department makes most of

its own spares, and there is no provision for the private owner.

Used car dealers are actively buying up every car offered for sale and reselling them at fancy prices. As a general rule a 1914 car with three years' service costs more at the present date than when it came out of the factory. All kinds of junk has been pressed into service; hundreds of ten-year-old touring cars which before the war would have been considered fit for the junk pile, have been fitted with a light truck body and sold at a substantial price. Nothing is too old for the road, and nothing is turned down by the dealer. All the old cars put into service are civilian machines, for the army has not yet released its hold of a single truck. There are in the military depots thousands of dollars worth of motor cars and parts which would be of great value to the civilian population, but they cannot be obtained. The importation of cars is not forbidden, but with a 70 per cent duty on all but heavy trucks, no touring cars or light trucks are being brought into the country.

### NATIONAL BRISCOE WEEK

Jackson, Mich., July 6—Briscoe distributors and dealers throughout the United States are celebrating national Briscoe week from July 7 to July 14, inclusive. The dealers and distributors of the Briscoe Motor Corp. are announcing the event by advertisements throughout the country and are arranging special decorations for their stores.

### RESTRICTS MACHINE TOOLS

London, June 30—The Minister of Munitions has given a notice of the withdrawal of a general permit to purchase or negotiate for purchase of machine tools and machinery driven by power for metal working. All applications for permit to purchase or enter into negotiations for such machinery are now made to executive officers of Area Clearing House Boards.

## Renault Plant Collapses

**Twenty-nine Killed and Sixty  
Injured When Three-Story  
Structure Tumbles**

**Over 1000 Workmen in Factory  
When Crash Came**

PARIS, June 14—At least twenty-one lives have been lost and sixty persons injured by the collapse yesterday of one of the Renault motor car factory buildings. The scene of the accident is a three-story building erected about ten years ago and used for motor car work. It was 490 by 130 ft.

About 10 o'clock in the morning warning was given by the fracture of one of the steel girders supporting the ceiling of the second floor. This breakage provoked the rupture of the electric cables supplying current to the motors driving the machine tools and gave warning to the 1000 workmen and women who were in the building at the time. While the majority rushed for safety, a certain number, believing there was no immediate danger, remained at their posts, and when the entire building collapsed 6 min. later they were buried in the ruins.

Ten hours after the accident twenty-one bodies had been recovered, four of these being unrecognizable. Men and women figured equally among the victims. Among the men are Spaniards and Chinese who had been imported for work in France. It is believed that the accident was caused by the overloading of the floors and the vibration of the machinery.

### DELAWARE REVOKES LICENSES

Wilmington, Del., July 10—The State authorities have begun a rigid enforcement of the State motor laws as amended at the last session of the Legislature, and in or-



**BATTERY OF FRANCE'S NEW JUGGERNAUTS OF WAR**—A battery of the new French St. Chamond tanks, the most gigantic and most powerful war machine of its type. The tanks are lined up in charge formation. When a battery of these irresistible tanks start on their way, it means trouble ahead for the enemy. The long range guns seen mounted in front are kept working while the tanks advance. They move on the creeper chain drive. Unlike the British tank, they are not built on circular lines and have not the same aptitude for crossing trenches. However, they can travel over the ground, no matter how rough it is. The tank is large enough to house from ten to twenty men, according to reports from the front. Passed by the French army censor



der to show that they mean business, they have revoked the licenses of several operators, who were found guilty of driving cars while intoxicated.

Time was when the inforcement of the motor laws was lax in the lower part of the state, but in the last few years things have been different and no quarter is to be shown violators. Inforcement of the law has been taken in hand personally by Attorney-General David J. Reinhardt, who has posted officers all over the state. Wilmington city authorities always have been particular about the matter. In New Castle county the county commissioners are aiding by placing special policemen on the main roads.

#### FORD "MELTING POT" GRADUATION

Detroit, July 6—The Ford English School conducted by the Ford company held its fourth graduation exercises on July 4 and graduated 400 men from the school, which is commonly known as the "Melting Pot" because of its conversion of students from foreigners to Americans.

#### ANGELL CONTINENTAL SECRETARY

Detroit, July 6—W. R. Angell has been elected secretary of the Continental Motor Corp. He succeeds A. H. Zimmerman, formerly secretary-treasurer, who continues as treasurer. Mr. Angell has been a large stockholder in the company for several years and has been in Detroit since January when the rapidly increasing business of the Continental company necessitated refinancing.

#### JOHN BARLEYCORN'S CAR SEIZED

Wilmington, Del., July 10—That a law passed by the Delaware legislature last winter, permitting the seizure, by the authorities, of cars, as well as other vehicles, engaged in illicit liquor business, is no myth was demonstrated a few days ago, when a motor car belonging to Clarence Macklin of Milford was seized by State Detective F. B. Murphy, at the direction of Attorney-General Reinhardt's office. The law authorizes such seizure and the subsequent sale of the car, the proceeds to go to the state.

Macklin and George Driggins, the latter of Smyrna, had been arrested by Constable E. E. James of Dover, and each was held in \$500 bail for court, the former for having more than four quarts of liquor in his car in "dry" territory and the latter for having more than one quart on his person.

The act under which the arrests was made, and which was passed by the last legislature, prohibits any person taking liquor into "dry" territory, except for their own use, and then they are restricted to a quart a month. The act also permits the seizure and sale of any vehicle used for transporting liquor into dry territory, and it is a question whether it would not permit the seizure of a railroad train, if an officer was so disposed.

## Border-to-Border Road

### Plan Concrete Military Highway from Canadian to Mexican Line

#### Will Bisect Continent Just East of Rocky Mountains

DENVER, Colo., July 6—A 1700-mile concrete military highway from the Canadian to the Mexican border, through Montana, Wyoming, Colorado and New Mexico, has just been proposed to the Federal Government by the Rocky Mountain National Military Highway Association, which was organized in Denver recently. The officers of the association are: State Highway Commissioner Thomas J. Ehrhart, elected president Charles Roam, Butte; Robert Carey, Cheyenne; Dr. F. L. Bartlett, Denver, and Eugene Kepanek, Santa Fe, vice-presidents respectively for Montana, Wyoming, Colorado and New Mexico; former Governor E. M. Ammons, Denver, secretary-treasurer. Besides the regular delegates from the territory directly interested, the meeting was also attended by A. L. Westgard, New York, transcontinental pathfinder and official of the National Highways Association.

The tentative route favored is from Fort Assiniboine, near Havre, Mont., to El Paso, Tex., a distance of 1696 miles. The main points touched are Fort Benton, Lewiston and Billings, Mont.; Sheridan, Buffalo, Casper, Douglas and Cheyenne, Wyo.; Fort Collins, Denver, Colorado Springs, Pueblo and Trinidad, Colo.; Las Vegas, Santa Fe, Albuquerque, Socorro and Las Cruces, N. M. There are seven national army posts and reservations directly on or closely connected with this route, and also four national parks in the states traversed.

Eighty-six million acres of public lands still subject to entry in these four states and 46,000,000 acres of forest reserve, already penetrated widely by good mountain roads and highly suitable for varied training in military operations, are among the advantages pointed out for building this road as an interstate and national enterprise.

#### MONTREAL SHOWS USED CARS

Montreal, Que., July 6—Sixty-one cars were sold at the first annual used car show held in Montreal under the auspices of the Montreal Automobile Trade Association recently. The total attendance for the seven days was 11,806. The amount of money that changed hands during the sale was \$66,900, an average for daily sales of \$9,700, more than \$1,000 a car. The record price paid for a single car was \$3,100 and the lowest, \$125. Many returned soldiers were present every day, the management admitting all men back from the front or in khaki without charge.

While the principal exhibitors were members of the trade many cars belonged to private owners and were sold by dealers on a commission of 5 per cent. Twenty-four dealers had exhibits. Every car had been inspected by a committee to make sure it was in good working order. A tag was placed on each car, showing the price, and prospective buyers were allowed demonstrations in the mornings, the show being open the rest of the day. More than 150 cars were displayed.

#### \$1,000,000 FOR PATENTS

Jackson, Mich., July 7—The H. M. Leonard Tractor Co., capitalized at \$1,500,000, soon will explain its capitalization to the state securities commission. According to the incorporation papers of the new company which took over the L. M. H. Investment Co. of Lansing, Mich., it is to pay the old company \$1,000,000 for the patents on a tractor which H. M. Leonard invented.

#### CHANDLER EARNS \$20 A SHARE

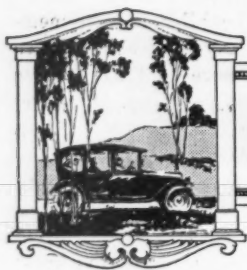
Cleveland, Ohio, July 6—Earnings of the Chandler Motor Co. for the first six months of 1917 were equivalent to over \$20 per share compared with \$24 per share for the full year of 1916. The company in six months manufactured and sold approximately 11,000 cars and shipments in June were in excess of 2000 cars. There has been no falling off in sales of Chandler car, it is stated, and the company is well covered in materials and supplies.

#### CARDWAY HEADS PACKARD EXPORT

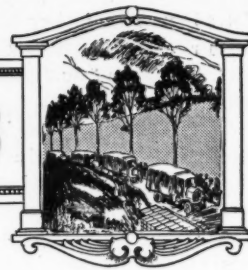
Detroit, July 6—Fred Cardway has been appointed manager of the export department of the Packard Motor Car Co. The Packard company has reorganized its export department in line with the present development of export business in South America, Africa, Australia and the far East. Mr. Cardway last winter made a trip to South America and established Packard dealerships in Rio de Janeiro, Buenos Aires and Montevideo.

#### THE EASTERN MOTOR INDUSTRY

New York, July 6—About 5 or 10 min. motoring from the row in New York are situated the motor factories of that city, in Queens borough across the East river from Manhattan. There are forty-two motor car plants employing nearly 9000 persons. A partial list includes such names as Packard, Ford, General Vehicle, Pierce-Arrow, Brewster & Co., Studebaker, Simplex, Rainier, Maxwell, Renault Freres, Delauney-Belleville and Rolls-Royce as motor car makers and Stewart, Prest-O-Lite, Moto-Meter and Norma, as well as about twenty-five others, among the accessory makers. Most of these plants, of course, are branches, but the sum total of products amount to \$37,448,000 in 1916.



## EDITORIAL PERSPECTIVES



### The New Export Embargo

IT is doubtful if the new export contract legislation by which the President, according to his recent proclamation, is to control shipments of necessities to foreign countries, will affect materially the motor car user in America. So far as can be ascertained, shipments of such things as gasoline, oil, steel, and motor cars, trucks, airplanes and parts for them which come under the control, have not been going in great volume within recent months to countries other than our allies, and it is more certain that shipments of these will continue to our allies in even

greater volume than before we entered into the war to assist in crushing German militarism.

OBSERVATIONS of layman motorists that the new ruling may work toward maintaining prices of cars and fuel at their present level, are not likely to prove true. The demand for these for both our own government and those of our allies is bound to be too great to be affected much by any cutting off of supplies to neutrals, or to the enemy through neutrals.

### Keep Up Road Building

THE fact that there has been little, if any, curtailment in actual work or plans for future work in the construction of new roads and repair of old roads on account of the war, is a most hopeful sign of a change in viewpoint of the country relative to the value of good roads. It is probable that ten years ago, a national crisis like this would have meant a very serious cutting down of expenditures for highway maintenance. The eastern world's stomach is feeling the pinch of hunger, and the demands on the products of America's broad acres and America's industries are growing with every passing hour. A great market is opening wider and wider and that there is greater need for all year round arteries for motor transportation, is being felt every day. In addition, there is the necessity of permanent motor roads for military uses. We have only to look to Europe to find the real value of highways in times of war. There, had not good roads prevailed, many Allied victories would have been defeats.

IT is significant that the first step of the government in commencing construction work on the vast army and aviation training camps has been the repair of old roads and the construction of new ones, to permit, first, the rapid transportation of men and materials to the site of the work and, later, the transportation of men and supplies when the camps are in operation. Production and handling of road building materials and public construction work, are fundamental industries of the country. Any tendency to suspend or postpone building projects would be inconsistent with maintaining our prosperity. Road and street improvements, in particular, should go on unabated. Bad roads and streets are factors of first importance in the present high cost of food stuff. Never before was the improvement of highways so essential. Bricks, cement, lime, sand, gravel, stone and other road building material industries are basic. Neither government regulations nor railroad restrictions should be enforced unnecessarily to interfere with them.

### Abusing The Spotlight

UNLESS many motor car users are more careful with the spotlight carried on the end of the windshield they will find themselves hedged round with a fence of state legislation imposing limitations on the use of the spotlight. The spotlight is an excellent attachment; in fact, it is one of the most useful on a car, and it would be too bad to find its free use limited by state legislation caused by abuse of it by the selfish motorist as well as by the thoughtless motorist.

GENERALLY the spotlight is carried much higher than the other lights and when it is used to light the road surface it is a worse dazzler than the headlights. When not in use it

should be turned off, but so many motorists require it apparently for lighting the road surface and have the inexcusable habit of turning it on an approaching car. Such motorists apparently do not appreciate that it blinds the driver of an approaching vehicle, and nothing can be more dangerous on the average country road. If the spotlight is used for illuminating the road surface it should be tilted at a sharp angle and not depended upon to illumine the road 200 feet ahead. Under no circumstances should it be turned upon an approaching car. One of the ideal uses for the spotlight is to illumine the right side of the road so as more clearly to define the ditch. In this role it is a desirable safety factor.



## Embargo Hits Materials

### New Export Ruling Affects Much That Goes Into Motor Vehicles

#### Will Become Effective Under Proclamation by President

WASHINGTON, D. C., July 9—Special telegram—The new export contract legislation, which will become effective under proclamation by the President, will affect oils, kerosene, and gasoline, pig iron, steel billets, scrap iron and scrap steel, but it will not affect motor cars, trucks, farm tractors, motorcycles and airplanes. Such articles as are put in the control list by the proclamation of the President, if exported will have to be shipped under specific permission of the export board. This means that, licenses having been secured for export purposes, the Bureau of Foreign and Domestic Commerce, through its various branch offices, will act upon applications under such licenses for export privileges of specified articles. In granting permission to export articles placed under embargo, according to the commerce department, the authorities will be controlled by three things.

These are, first, whether such exportation would tend to cause a stringency with consequent high prices, in this country; second, whether such exportation would tend to make it possible for Germany to be aided by any possible surplus in the hands of neutrals; third, whether such exportation would aid in equally distributing the supply offered of fuel and iron among the allied nations.

While no indication has been given as to a possible second proclamation placing additional articles upon the embargo list, it rests with the President to issue such proclamation if, in his judgment, the situation requires it.

#### ENGER PROPERTY BRINGS \$70,000

Cincinnati, Ohio, July 6—The factory and sites of the Enger Motor Car Co. have been authorized to be sold to William Magly at his bid of \$70,000. The receiver has \$88,129.87 on hand, not including the \$70,000 from the sale of the property. Among the creditors' claims there is \$180,000 disputed, including \$60,000 by the Fifth-Third National Bank.

#### SHRINERS STAGE RELIABILITY

Chicago, July 9—Motor contests among different chapters of fraternal organizations offer a means of making members better acquainted, and at the same time, present an opportunity for the competitive element in family outings. Chicago Shriners have started a contest of this kind which, it is understood, is to be an annual affair. Two of the organizations of the

Shriners have motor clubs as subsidiary organizations. One of these is the Medinah Temple Motor Club and the other the Mystic Athletic Club. These two organizations had an inter-club contest Sunday to Cedar Lake, South Bend and return, taking two days to the trip. While the rules were modeled somewhat after the inter-club contests which the Chicago Automobile Club and the Chicago Athletic Association have made classic, they differed in the fact that they were made a family affair, as women were permitted on the run, and women contestants were admitted. That the run proved popular was shown by the fact that there were ninety-one cars contesting, sixteen of which made perfect scores. One of the perfect scores was made by a woman driver.

#### HIGHWAY TOUR ON SCHEDULE

Chillicothe, Mo., July 8—The Pike's Peak Ocean-to-Ocean highway tour from Indianapolis to Colorado Springs reached here on schedule time. Roads were good all the way. Five cars are going through to a meeting on Pike's Peak July 10 and 11. A speed of 30 to 50 miles was maintained, last 38 miles made in 50 min. The meeting, which is to be held on the summit of Colorado's famous mountain, will be the highest of the kind ever promoted and will be attended by trail men from all parts of the west.

#### E. & J. SALES \$1,150,000

Detroit, July 7—Total sales of the Edmunds & Jones Corp. for the five months ended May 31, 1917, are reported in excess of \$1,500,000. Through operation of the sinking fund more than \$80,000 of the preferred stock has been acquired and cancelled.

## Fuel at 1c per Gallon

### Missourian in Washington with New Formula for Making Gasoline More Cheaply

#### Will Convert Kerosene Into Gas at Very Reduced Cost

WASHINGTON, D. C., July 9—Louis Bond Cherry of Kansas City, Mo., is in Washington for the purpose of submitting to the government an electro-chemical process for the conversion of kerosene into synthetic gasoline at a cost, according to Mr. Cherry, of less than 1 cent a gal.

Mr. Cherry describes his process as the successful application of the electro-magnetic theory of matter by mixing hydrocarbons. In a test plant at Coffeyville, Kan., he said, 78 per cent of kerosene has been converted into water-like gasoline of quality sufficiently high to do first-class dry cleaning or run a motor car. Gasoline may be produced also from other low-grade distillates of crude oil, such as solar oil and gas distillate, he asserted.

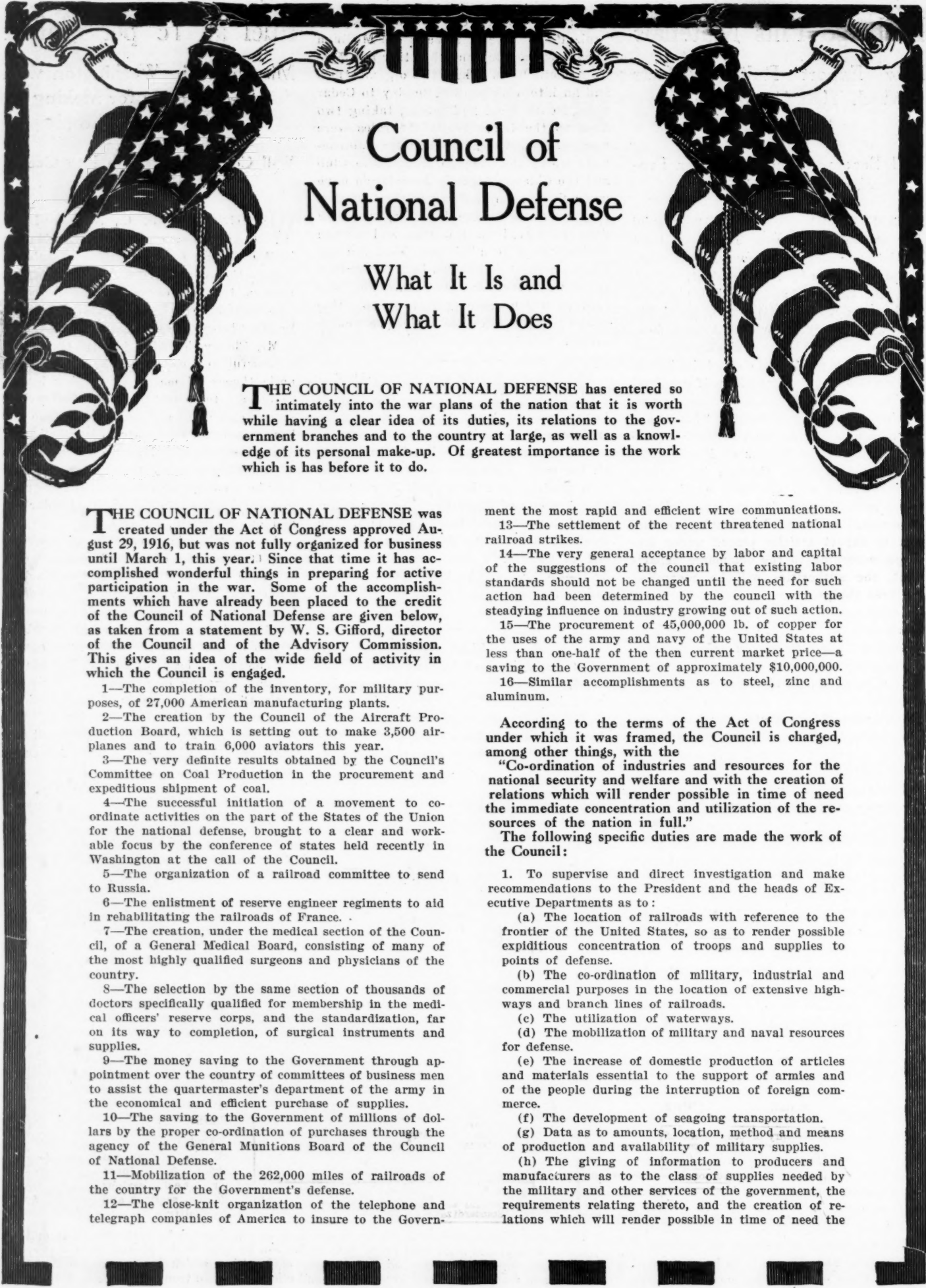
An electric plant capable of converting 60,000 gal. of distillate per day has been built and tested at the Sinclair refinery in Coffeyville, Mr. Cherry said. He is now experimenting with the proper length and diameter of treating chambers required. As soon as these experiments are completed, he said, he will be able to convert kerosene into gasoline.

Mr. Cherry is a member of the American Institute of Electrical Engineers, the American Electrochemical Society and the American Association for the Advancement of Science.



The latest French tank to make its appearance on the battlefield is the St. Chamond tank. It is armed with long range guns which can be seen in the photo. It is a very heavy machine and moves on the creeper chain drive which has made the tanks famous in warfare for their great power and effectiveness in trench capture in Europe





## Council of National Defense

### What It Is and What It Does

**T**HE COUNCIL OF NATIONAL DEFENSE has entered so intimately into the war plans of the nation that it is worth while having a clear idea of its duties, its relations to the government branches and to the country at large, as well as a knowledge of its personal make-up. Of greatest importance is the work which is has before it to do.

**T**HE COUNCIL OF NATIONAL DEFENSE was created under the Act of Congress approved August 29, 1916, but was not fully organized for business until March 1, this year. Since that time it has accomplished wonderful things in preparing for active participation in the war. Some of the accomplishments which have already been placed to the credit of the Council of National Defense are given below, as taken from a statement by W. S. Gifford, director of the Council and of the Advisory Commission. This gives an idea of the wide field of activity in which the Council is engaged.

- 1—The completion of the inventory, for military purposes, of 27,000 American manufacturing plants.
- 2—The creation by the Council of the Aircraft Production Board, which is setting out to make 3,500 airplanes and to train 6,000 aviators this year.
- 3—The very definite results obtained by the Council's Committee on Coal Production in the procurement and expeditious shipment of coal.
- 4—The successful initiation of a movement to co-ordinate activities on the part of the States of the Union for the national defense, brought to a clear and workable focus by the conference of states held recently in Washington at the call of the Council.
- 5—The organization of a railroad committee to send to Russia.
- 6—The enlistment of reserve engineer regiments to aid in rehabilitating the railroads of France.
- 7—The creation, under the medical section of the Council, of a General Medical Board, consisting of many of the most highly qualified surgeons and physicians of the country.
- 8—The selection by the same section of thousands of doctors specifically qualified for membership in the medical officers' reserve corps, and the standardization, far on its way to completion, of surgical instruments and supplies.
- 9—The money saving to the Government through appointment over the country of committees of business men to assist the quartermaster's department of the army in the economical and efficient purchase of supplies.
- 10—The saving to the Government of millions of dollars by the proper co-ordination of purchases through the agency of the General Munitions Board of the Council of National Defense.
- 11—Mobilization of the 262,000 miles of railroads of the country for the Government's defense.
- 12—The close-knit organization of the telephone and telegraph companies of America to insure to the Govern-

ment the most rapid and efficient wire communications.

13—The settlement of the recent threatened national railroad strikes.

14—The very general acceptance by labor and capital of the suggestions of the council that existing labor standards should not be changed until the need for such action had been determined by the council with the steady influence on industry growing out of such action.

15—The procurement of 45,000,000 lb. of copper for the uses of the army and navy of the United States at less than one-half of the then current market price—a saving to the Government of approximately \$10,000,000.

16—Similar accomplishments as to steel, zinc and aluminum.

According to the terms of the Act of Congress under which it was framed, the Council is charged, among other things, with the

"Co-ordination of industries and resources for the national security and welfare and with the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the nation in full."

The following specific duties are made the work of the Council:

1. To supervise and direct investigation and make recommendations to the President and the heads of Executive Departments as to:
  - (a) The location of railroads with reference to the frontier of the United States, so as to render possible expeditious concentration of troops and supplies to points of defense.
  - (b) The co-ordination of military, industrial and commercial purposes in the location of extensive highways and branch lines of railroads.
  - (c) The utilization of waterways.
  - (d) The mobilization of military and naval resources for defense.
  - (e) The increase of domestic production of articles and materials essential to the support of armies and of the people during the interruption of foreign commerce.
  - (f) The development of seagoing transportation.
  - (g) Data as to amounts, location, method and means of production and availability of military supplies.
  - (h) The giving of information to producers and manufacturers as to the class of supplies needed by the military and other services of the government, the requirements relating thereto, and the creation of relations which will render possible in time of need the

immediate concentration and utilization of the resources of the nation.

2. To report to the President or to the heads of Executive Departments upon special inquiries or subjects appropriate thereto.

3. To submit an annual report to Congress through the President, giving as full a statement of the activities of the Council and the agencies subordinate to it as is consistent with the public interest, including an itemized account of the expenditures made by the Council, or authorized by it, in as full detail as the public interest will permit, providing, however, that when deemed proper the President may authorize, in amounts stipulated by him,

unvouchered expenditures, and report the gross so authorized not itemized.

The Council of National Defense proper consists of six cabinet members, with the Secretary of War as chairman. The membership is as follows:

Secretary of War.....Newton B. Baker  
Secretary of the Navy.....Josephus Daniels  
Secretary of the Interior.....Franklin K. Lane  
Secretary of Agriculture.....David F. Houston  
Secretary of Commerce.....Wm. C. Redfield  
Secretary of Labor.....Wm. B. Wilson

#### Members of Advisory Commission

The members of the Advisory Commission are:

Daniel, Willard, Chairman, president of the Baltimore & Ohio Railroad; transportation and communication.

Howard E. Coffin, vice-president of the Hudson Motor Car Co., munitions, manufacturing, including standardization and industrial relations.

Julius Rosenwald, president of Sears, Roebuck & Co.; supplies, including clothing.

Bernard M. Baruch, financier; raw materials, minerals and metals.

Dr. Hollis Godfrey, president of the Drexel Institute; engineering and education.

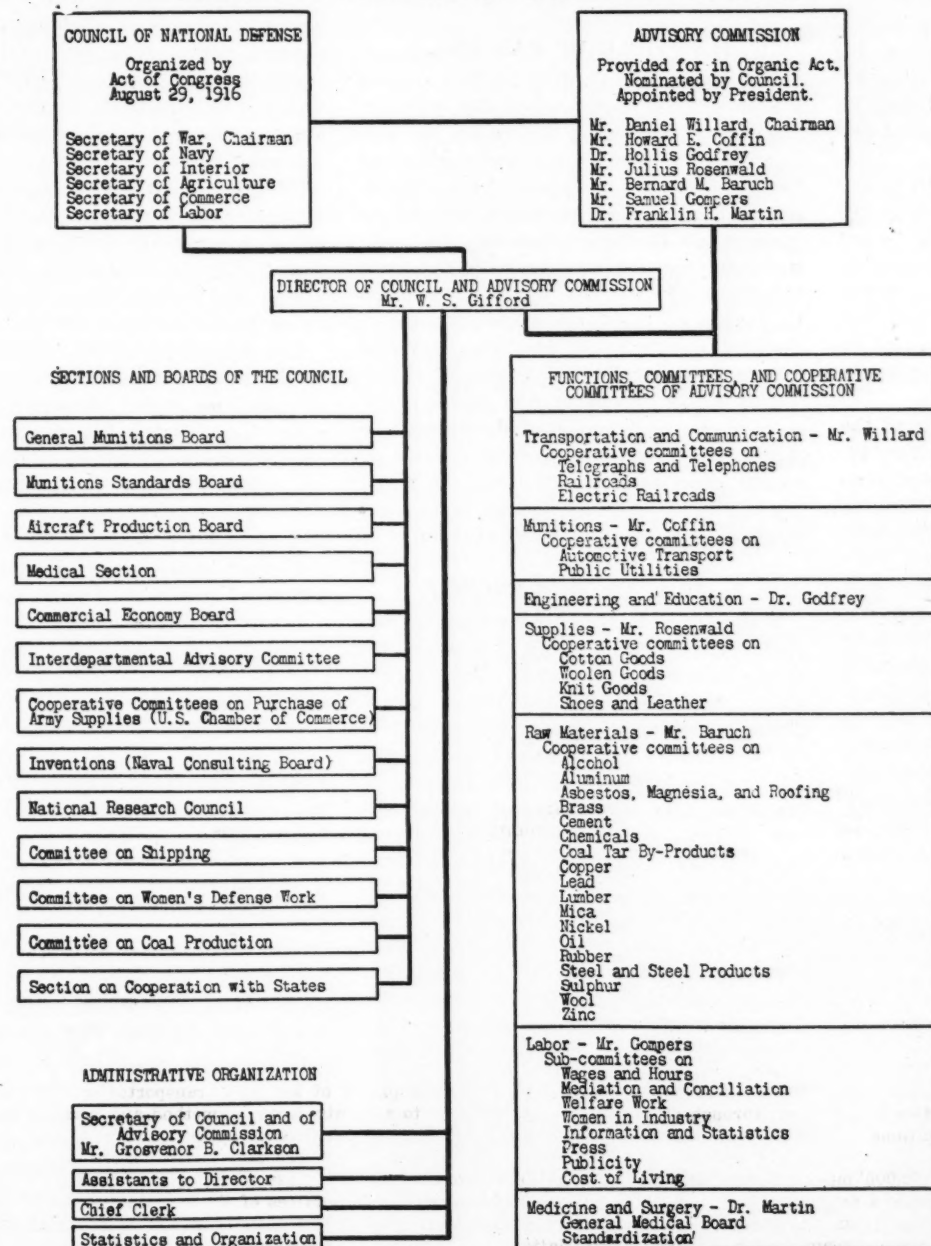
Samuel Gompers, president of the American Federation of Labor; labor, including conservation of health and welfare of workers.

Dr. Franklin Martin, secretary general of the American College of Surgeons; medicine, surgery and sanitation.

The Director of the Council and Advisory Commission is Walter S. Gifford, and the Secretary of the Council and Advisory Commission is Grosvenor B. Clarkson.

Under both Council and Commission there have been created various boards, sections and committees.

## Government's Chart Showing Relations of Divisions of Council of National Defense





## Vast Birdman Army

Plans Under Way for Training  
of 75,000 to 100,000  
Aviators

House Military Committee Figures  
on \$750,000,000 Fund

WASHINGTON, D. C., July 9—Uncle Sam was told to-day of plans for an army of from 75,000 to 100,000 aviators to be trained and equipped to help lick Germany to-day. Brig. Gen. Squier, chief signal officer of the army, detailed the plan.

In an executive session, Gen. Squier went over the aviation personnel bill with the committee section by section, answering questions and explaining various features of the plan. Although none of Gen. Squier's testimony was given out, it was understood that his explanation of the aviation plans of the United States impressed the committee deeply and that his bill probably will be reported without material change.

Members of the committee said to-day that a large appropriation, probably in the neighborhood of \$750,000,000, might be put on the personnel bill after it is thoroughly explained to the committee. The appropriation was not put on the original bill, for the reason that the committee had no estimates on which to base the appropriation.

This appropriation will be a part of the \$1,000,000,000 which some aviation experts think will be enough to equip an American aeroplane army of sufficient size to enable the allies to drive the Germans from the air.

Naval aeronautics also is not being overlooked and Secretary Daniels to-day recommended to congress an appropriation of \$45,000,000 for this purpose in addition to amounts already available. This appropriation, the secretary explained, will be required to maintain and extend existing schools and stations, to establish new stations and to purchase aircraft, seaplanes, dirigibles and kite balloons for use on the high seas, from coastal stations at home and in co-operation with the allies.

### RANTOUL FLYING FIELD PROGRESS

Washington, D. C., July 9—Rapid progress in the construction of the aviation fields for training fighting fliers for the war is being made, according to Howard Coffin, chairman of Aircraft Production board, who has just returned from an inspection trip. He believes that the Chanute field at Rantoul, Ill., where 2000 men are at work; the Wilbur Wright field at Dayton, Ohio, on which 3000 workmen are employed, and the Thomas Selfridge field at Mount Clemens, Mich., will be completed by July 15.

"Work on the Chanute field has broken all records," said Mr. Coffin. "A half mil-

lion dollars' worth of buildings have been put up practically within a month. They form a village a mile long and the flying field which they occupy was a few weeks ago simply a collection of cornfields."

### SELFRIDGE FIELD OPEN SOON

Mt. Clemens, Mich., July 9—Work on the Selfridge aviation field near here is rapidly approaching completion. The twelve large hangars, each capable of accommodating six airplanes, are practically completed and machines and embryo flyers are expected at the camp within a week. The barracks and officers' quarters are ready and the whole field is rapidly assuming the appearance of a military camp. Timber which occupied considerable portion of the field has been removed. Two trained aviators who recently arrived in this country from the French army are here ready to begin the instruction of the new birdmen.

### MAY HOLD UP TAX BILL

Washington, D. C., July 9—The chances are it will be weeks before the war revenue bill comes before the Senate for consideration in view of the notice given by Senator Simmons, chairman of the committee on finance, that he would ask the recommitment of the revenue measure in order that provision may be made for taxes to take the place of that expected to be lost by reason of the further manufacture of distilled spirits being forbidden under a Senate amendment to the food control bill.

This means that those who oppose provisions in the revenue bill as drawn such as the tax on advertising, increased rates on second class postage, etc., will be given further opportunity to present their arguments in opposition to such taxation.

### B. OF S. TO TEST ENGINES

Washington, D. C., July 7—Tests of airplane engines will be made at a laboratory at the Bureau of Standards. At a recent meeting of the subcommittee on power plants of the national advisory committee for aeronautics, preparations were made for the development at the Bureau of Standards of a laboratory for testing aircraft engines under conditions of altitude and temperature similar to those encountered in flights at an altitude of 20,000 ft. or more. The laboratory and its experimental equipment will be organized under the auspices of the advisory committee, and the investigations will be directed by the subcommittee on power plants.

### TO MAKE TRUCK ENGINES

Detroit, July 9—The Continental Motor Co. opened to-day after a shut-down of four days made for machinery readjustments will make truck engines as well as passenger car engines in its Detroit factory. Heretofore the company manufactured passenger car engines exclusively and the truck engines have been turned out exclusively by the Muskegon plant.

## National Dealers' Body

Representatives from Wide Area  
Gather to Perfect Organiza-  
tion

Largest Men of Industry Present at  
Chicago Meeting

CHICAGO, July 10—Dealers and distributors of motor cars from all parts of the United States are meeting at the Hotel La Salle in this city to-day and to-morrow to form the National Automobile Dealers' Association. The first session began this morning at 10 o'clock. The meeting will conclude to-morrow afternoon.

The association is being formed by the largest motor car men in the country, some of whom do an annual business that amounts to millions of dollars. Those attending the meeting are mostly from the big distributing centers, but the membership will be open to all the dealers throughout the country, large towns, small towns and rural centers.

The object of the new organization is to look after the interests of the dealer and to effect greater co-operation through the gamut of car merchandising, from the manufacturer, through the distributor and dealer to the ultimate consumer.

The organization idea had its inception at the time of the recent proposal to tax all cars 5 per cent. Through the efforts of a few large dealers this tax was defeated, and the success attained at that time emphasized the value of a greater co-operation. The next step was the formation of a provisional committee which has since that time been engaged in perfecting the details of preliminary organization.

George W. Browne, Milwaukee, Overland distributor, is acting as permanent chairman and Bart J. Ruddle, Milwaukee association manager, as secretary. Among the cities represented are Boston, Albany, Utica, Syracuse, Rochester, Buffalo, Philadelphia, Baltimore, Atlanta, Jacksonville, Trenton, Newark, Pittsburgh, Cleveland, Columbus, Detroit, Grand Rapids, Chicago, Milwaukee, Green Bay, Minneapolis, St. Paul, Duluth, Fargo, Des Moines, Davenport, Kansas City, St. Louis, Louisville, Dallas, Los Angeles, San Francisco, Denver, Indianapolis and Portland, Me.

### FINNEY OPENS PHILLY OFFICE

Philadelphia, Pa., July 8—Olin Finney & Co. have opened an office at 15 Broad street for the purpose of handling business in New York, New Jersey and New England. This office will be in charge of P. T. Barbour, formerly motor car manager of the New York Tribune and the Chicago Tribune.

The Finney system of motor car banking is a new idea in financing, its distinctive features being that the Finney company



finances the purchaser of the car rather than having the dealer finance the purchaser. Under the Finney system purchasers can borrow money directly from that company without calling on the dealer to finance them.

#### MAKE OWN BUSES

New York, July 8—War conditions have forced the Fifth Avenue Coach Co. to go into the manufacture of its own trucks. This company has acquired property at 132d street and Broadway for the erection of a four-story plant for the manufacture of motor buses. The proposed plant is estimated to cost about \$1,000,000.

The company has already assembled about sixty of its new trucks and is planning to produce 200 in all, under its own specifications. The Moline Knight engine will be continued with certain modifications.

Before the war started the company imported hundreds of buses from France, the majority of them being De Dions. Since then, through its engineers, it has designed its own trucks and is assembling them with parts of its own design.

#### KELSEY WHEEL LISTED

Detroit, July 9—The preferred and common stock of the Kelsey Wheel Co. of Detroit is listed among the new securities on the New York Stock Exchange to the extent of \$2,010,100 of 7 per cent cumulative preferred stock and \$8,385,300 common.

#### STUDEBAKER BRANCH IN OKLA.

Oklahoma City, Okla., July 7—The Studebaker Corp. has taken over the business of the Renlau Motor Co. and is establishing a branch here. The Studebaker Corp. has recently taken over a number of other retail companies which it is converting into branch houses. A branch has also been established at Joplin, Mo.

#### AUSTRALIAN CAR SHORTAGE

Sydney, N. S. W., June 15—Motor car shortage is expected in this country on account of the freight condition, which is going to be serious. Favorable action by the National party, which has just been returned to power through the federal elections, is expected, however. This party, it is expected, will be reasonable in its treatment to the motor car trade when dealing with those articles which the Government has been terming as luxuries.

#### CURTISS EXPECTS ALLIES CALL

Toledo, Ohio, July 5—It is expected that the Curtiss Aeroplane Co., of which John N. Willys, president of the Willys-Overland Co. is to become president, will receive orders from the Allies during the next two or three months for more than \$60,000,000 worth of airplanes. Great Britain is expected to require at least 2000 completed biplanes and 2000 additional engines. Two thousand biplanes involve a cost of \$27,000 each and the 2000 engines will probably average \$4,000 each.

## To Test Car Performance

### Hoosier Speedway Now Has Device for Determining Certain Features

#### More Accuracy in Results of Tryouts Will Be Possible

INDIANAPOLIS, Ind., July 9—Apparatus by which the standard S.A.E. car performance test may be carried out has been installed at the Indianapolis speedway, under the direction of Chester S. Ricker, A.A.A. representative in Indiana, and technical representative of the speedway. The car performance test as standardized by the Society of Automotive Engineers gives accurate data of economy, acceleration and other points which determine the value of a car from a performance standpoint.

The fuel economy testing apparatus consists of special tanks and means for weighing the fuel, and these tests are run at seven different speeds. The most important feature of the S.A.E. test on fuel economy is the weighing of the gasoline used in running a given distance. Instead of running out a given quantity of gasoline and measuring the distance, as is a common method, the former is very much more accurate.

In addition to providing accurately for tests in fuel consumption, an acceleration testing device has been provided. This was operated by an electric contact attached to one of the front wheels, and gives an autographic record on the tape of the speed at any one-tenth second of the run.

These tests can be run off by any one who desires the information, at a nominal cost, and in about two days' time.

The Allison Experimental Co., adjacent to the speedway, is installing a 600 hp. Sprague dynamometer, so that it will be possible to make combined laboratory and

speedway tests of car and airplane motors. The overhead bridge which crosses the north end of the speedway has been removed to permit airplanes to land at any point on the speedway in safety.

#### DICKSON DIVISION HEAD

Indianapolis, Ind., July 9—R. B. Dickson, who has been battery service station supervisor for the Prest-O-Lite Co., Inc., in its Detroit territory, has been appointed division manager of the Indianapolis territory with headquarters at the Indianapolis downtown branch.

In his new capacity, Mr. Dickson has charge of the sales development of the Prest-O-Lite products in a territory including most of Indiana and parts of Ohio, Illinois and Kentucky. He succeeds Major W. P. Carpenter who has been called to the colors.

#### ANTI-GLARE FOR AUSTRALIA

Sydney, N. S. W., June 15—Action against headlight glare is expected to be taken in the near future by the police in this country. The matter will be taken care of through the superintendent of motor vehicles, police department in each of the capitals, viz: Sydney, N. S. W.; Melbourne, Victoria; Brisbane, Queensland; Adelaide, South Australia, and Perth, Western Australia.

#### PULLMAN SALE ORDERED

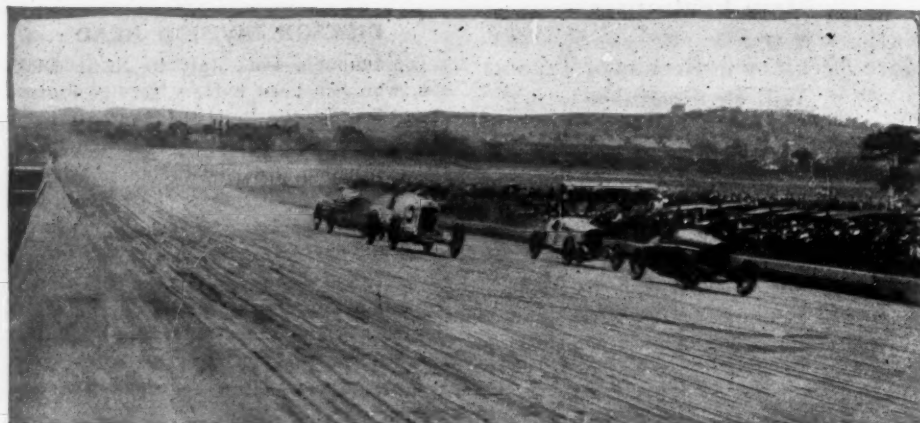
York, Pa., July 7—Judge Charles B. Witmer of the United States district court at Sunbury last Monday signed a decree authorizing W. A. Keyworth, Carlton L. Hoff and Henry D. Schmidt, receivers of the Pullman Motor Car Company, to sell at public sale on Tuesday, July 24, all of the assets of the Pullman Motor Car Co. Two different guarantees were presented and considered by Judge Witmer, who rejected both and ordered a sale without guarantee and for the highest bid, thus finally disposing of the controversy.



Some of the Chicago Shriners at Cedar Lake, Ind., on the Inter-Club Sociability-Reliability contest between the Mystic A. C. and the Medinah Temple Motor Club

# Boyer Victor in Uniontown Foursome

## Vail's Hudson Second, Cooper's Stutz Third



Getting away on the first lap in Uniontown match race

UNIONTOWN, Pa., July 4—Fifteen thousand people, witnessing the most successful racing meet yet staged by the Uniontown Speedway Association, saw Joe Boyer, driving a Frontenac car, snatch victory from Ira Vail in the three-heat world's championship match race in a bit of the craftiest driving ever seen on the local track.

The fact that Vail was forced to stop in the fifth lap of the third heat for a tire change cost him the heat victory which would have meant the race victory, inasmuch as he had won the second heat of twenty laps. The additional fact that Boyer, realizing that there was trouble with a rear tire, began to slow down in the fortieth lap, yet driving with every ounce of energy the weakened tire would stand, pulled across the tape in the finish line just ahead of the Hudson driver. Vail lost a lap and three-quarters in the tire change early in the race. He gradually was making up the difference and when Boyer's tire began to give trouble the doughty Hudson pilot was closing up the distance with leaps and bounds, but Boyer gaged well the troublesome tire and came home the victor.

The professional world's championship match race was won in three heats of ten, twenty and fifty laps, respectively. Entered in the event were Earl Cooper, driving the Stutz car with which he won the Chicago Speedway War Derby on June 16, Ira Vail, driving the Hudson with which he finished second at Cincinnati on May 30, Joe Boyer, driving the Frontenac, and Louis Fontaine, driving Ralph de Palma's old Mercedes.

### Uniontown Finish

Driver	Car	Points	Prize
Boyer, Frontenac.....		5	\$1500
Vail, Hudson .....		6	1250
Cooper, Stutz .....		9	1000
Fontaine, Mercedes.....		10	750

Cooper did a bit of sensational work in the seventeenth lap of the 20-lap heat when, driving down past the crowded grandstand in the home stretch at the rate of 98 m.p.h., his right rear tire blew. The machine cut up toward the top guard rail, swerved again toward the apron, but Cooper quickly gained control of the machine and dashed past the grandstand to the cheers of thousands who a moment before expected to see the machine hurtle off the course. Fontaine, at the time, was just behind Cooper, driving at a slightly slower speed, and demonstrated his mastery when he quickly cut down towards the apron and safely was out of danger.

The first heat of ten laps was won by Boyer, the four entries finishing without a stop. The time for the heat was:

Boyer .....	6:53:72
Cooper .....	6:54:34
Vail .....	6:54:44
Fontaine .....	6:59:60

It was in the second heat of twenty laps that Cooper blew a tire, the stop forcing him into fourth place, inasmuch as he had but three laps to go when the mishap occurred. Joe Boyer was forced into the pits in the fourteenth lap of this event on account of engine trouble, losing four

laps. He was back for the last two laps finishing third. The time for the second heat follows:

Vail .....	13:52:49
Fontaine .....	13:57:78
Boyer .....	14:17:28
Cooper .....	

The third heat of fifty laps developed some sensational driving and the winner averaged 95 m.p.h. on the 1½-mile board course. Vail was forced to the pits in the fifth lap for a right rear, and lost a lap and three-quarters. His sensational passing of Cooper's Stutz on the eighth lap brought infield and grandstand crowds to their feet in a wild cheer and his desperate effort in the last few laps to snatch victory from Joe Boyer's Frontenac made him a popular favorite. Louis Fontaine went out in the nineteenth lap on account of engine trouble and lost many laps. He returned to the race when the leaders were finishing their thirty-third lap and remained in until Boyer and Vail had finished the event. Fontaine then went to the pits, no time being taken on him for this event. The time for the third heat follows:

Boyer .....	35:24:88
Vail .....	35:26:52
Cooper .....	36:00:44
Fontaine .....	

Scoring was under the Russian point system, the winner in each event being allowed one point, the second man two and so on. The driver with the least number of points won the race.

### Dealers' Race

THE dealers' race of 100 laps, 112½ miles, proved perhaps the most exciting feature of the afternoon's program. Red Fetterman, Pittsburgh, driving the Peerless eight, won first honors, cinched the track championship for the year in the dealers' class, and smashed the track record held by Louis Chevrolet when he won the Universal trophy cup at the preliminary opening last Thanksgiving. Fetterman averaged 92 m.p.h., making the entire course without a stop. He was forced to push his car to the utmost by D. W. Hickey, Connellsville, driving the second race of his career in the Hudson Super Six which was formerly owned by Ira Vail and

### Equipment of Cars in Championship Race at Uniontown, Pa., July 4

Car and driver	Bore	Stroke	Displ.	Carb.	Ignition	Plugs	No. plugs	No. valves	Valve location	Tires	Wheel-base	Wheels	Oil
Frontenac, Boyer.....	3 3/4	6 1/2	295	Miller	Bosch	K.L.C.	8	16	Head	Goodyear	104	R.W.	Oilzum
Hudson, Vail.....	3 1/2	5	288	Hudson	Delco	A.C.	6	12	Side	Goodyear	112	R.W.	Oilzum
Mercedes, Fontaine.....	3 1/2	6 1/2	279.6	Mercedes	Bosch	Special	8	16	Head	Goodyear	112	R.W.	Monogram
Stutz, Cooper.....	3 1/2	6 1/2	296	Miller	Bosch	Royal	8	16	Head	Goodyear	102	R.W.	Aristo



which Vail drove at Sheepshead Bay, New York, at the rate of 103 m.p.h. Hickey likewise smashed the old track record. The Hudson Super Six driven by Jack Conway, of Greensburg, romped in in third place, a minute behind the leader after driving a non-stop race. The Hudson cars had a field day meet winning second and third places in the dealers' race, second place in the Australian Pursuit race and second place in the world's championship match race.

Fetterman's winnings for the day aggregated \$1,450, having taken a bonus of \$500 and the silver cup offered to the track champion, winner of three of the five dealers' events scheduled for the Uniontown track this year.

The dealers' race was replete with unusual features. Five of ten starters in the

112½-mile grind finished without a stop at the pits. The Mercer, driven by George Gardner of Pittsburgh, retired early in the race with engine trouble. The Packard Greyhound, driven by Wilmer Monahan, of Uniontown, did some form of a death loop on the southwest curve when a tire blew, the machine turning around three times, finally landing right side up and with the driver and his mechanic unscathed. The results in the dealers' race follow:

Average—92 m.p.h.		
Driver	Car	Time
Fetterman, Peerless	....	1:13:40.56
Hickey, Hudson	.....	1:13:55.03
Conway, Hudson	.....	1:14:39.96
McFarland, Murray	.....	1:14:55.50
Shoff, Haynes	.....	1:15:42.27

Fetterman, Haynes..... 1:18:00.16  
 Robinson, Haynes.....  
 Nikrent, Paige.....  
 Purses—\$750, \$500, \$400 \$300,  
 \$200, \$100.

Four cars entered the Australian pursuit race, only the cars finishing one, two, three, four in the dealers' event being eligible. The race was twenty laps but a car was out when it was passed by another driver. Conway passed the Murray car, driven by McFarland, Hickey in another Hudson Super Six passed Conway and Fetterman passed Hickey. The prize money went to Fetterman, Hickey, Conway and Murray in the order named, the prizes being \$200, \$150, \$100 and \$50.

The attendance at the races is estimated at more than 15,000.

# Tacoma Race Won by Patterson

## Hudson Pilot Does 90.4 M.P.H.—Durant Second

TACOMA, Wash., July 5—Between 15,000 and 20,000 saw Patterson in a Hudson win the 150-mile Pacific Coast Championship event on the Tacoma speedway and incidentally break the track record, traveling 90.4 m.p.h. for the 150 miles. Roads and Malcolm, in Hudsons, took third and fourth places respectively. Cliff Durant, in Chevrolet Special, drove a smashing race and took second place. The unofficial time of winner was 1:47:2.

The 50-mile consolation event, in which four cars started, was won by Jimmy Crosby in a Duesenberg special, the distance being covered in 39 min. Clyde Rhodes in a Hudson, second; Hans Malcolm, Hudson, third.

A perfect day of racing was marred by the death of the popular Tacoma driver, Conrad Hanson, who with his mechanic Fred W. Johnson in their Hudson mount left the track just a few yards below the spot where Billy Carlson was killed two years ago and where Dingley came within a hair's breath of losing his life a few years earlier. The accident happened in the eighteenth lap when Hanson was in seventh place and vainly trying to nose out his nearest competitor. He was taking the dangerous turn at a speed of 85 m.p.h. when the big Hudson skidded half way around, plunged over the 30-in. guard rail and threw the riders down onto the jagged rocks 12 ft. below. Hanson was quickly rushed from the field but died in a few seconds. Johnson is seriously injured. Hanson has been a popular figure in Tacoma racing circles for the last five years. He drove in the Montamarathon in 1912, taking fourth place in a Hudson. In 1914 he rode as mechanic.

The Romano Special driven by Latta, was forced out almost at the start of the race by ignition trouble. James Buttera was disqualified from driving his Buttera

Special by the technical committee, and Quinn entered as a driver of a National, failed to appear.

Durant in his Chevrolet shot into the lead on the second lap, closely pursued by

### MINNEAPOLIS RACE JULY 14

Chicago, July 10—Minneapolis is to have a race next Saturday. Fred Wagner arranged to have the ban against the Fort Snelling Speedway lifted for one day and there will be a 100-mile race, probably one 50-mile and some other events in which practically all drivers seen on tracks this year will take part. The drivers will share in the gate and 10 per cent of the gross will go to the Red Cross.

### DE PALMA DEFEATS OLDFIELD

Detroit, July 6—Ralph de Palma defeated Barney Oldfield in all events in the series of three races held at the Michigan State Fair Grounds July 4. De Palma drove his Packard twin-six and Oldfield sat behind the wheel of his "submarine" for the trio of matches. De Palma led throughout the program and forced Oldfield to take his dust. In negotiating the 25 mile race de Palma made it in 21 min. and 2½ sec., creating a new record for the distance, the best previous authentic time having been made by Bob Burman at Bakersfield, Cal., in 21:37:60. De Palma won his races through the superior speed of his car, which he used to excellent advantage on the stretches. Oldfield displayed his usual nerve in the turns and almost invariably picked up the ground that de Palma just as often retrieved in the straightaway. Fifteen thousand people attended the race. The summaries:

15 miles—De Palma; time, 13:2½.  
 25 miles—De Palma; time, 21:2½.  
 10 miles—De Palma; time, 8:38¼.

Patterson. Durant showed considerable pep and Patterson and Parsons were unable to overtake him. Bales in Majestic special and Hanson in Hudson both stopped at pits in third lap on account tire trouble. Price driving a Duesenberg was forced out in the sixth lap with cracked cylinder.

Durant did some sensational driving, taking the curves high, running around 89 miles an hour, in the fourteenth and fifteenth laps, with the balance of the field running 85 m.p.h. It was in the forty-first when Durant came in for front right tire that Patterson forged ahead and kept the position for three laps. Durant, however, came right back in the fifty-seventh lap with a speed of 91 m.p.h. and took the lead again in the sixtieth when he increased his speed still another notch.

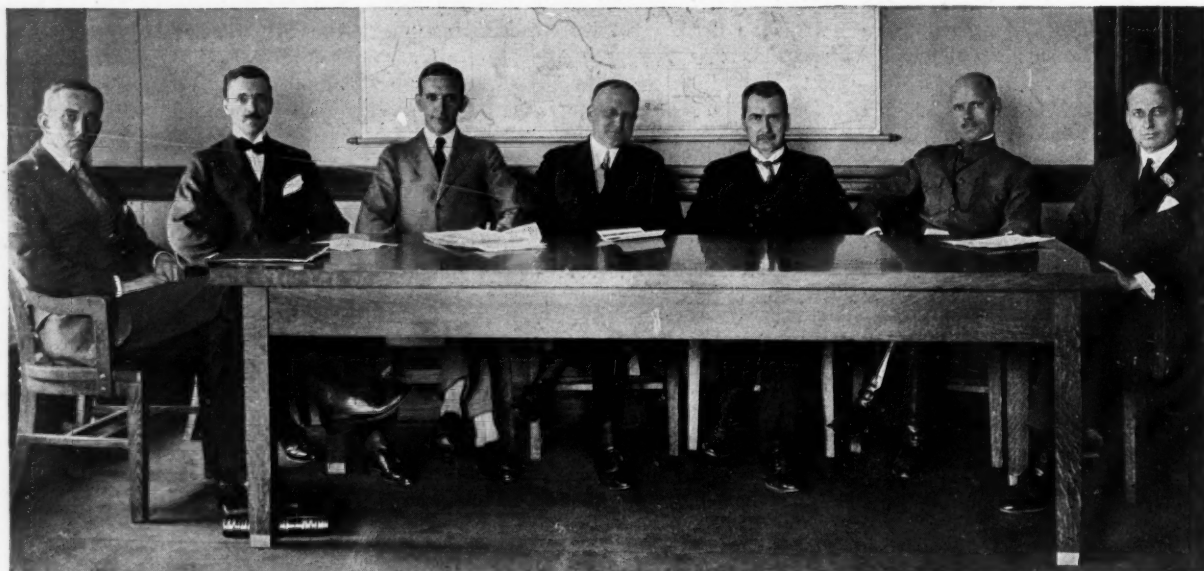
Patterson shoved on more power in the seventy-first lap and Durant was forced to drop back. Although he kept fighting to the finish his engine seemed to fail him at the critical moment and Patterson by his consistent driving finished a good lap ahead of the Chevrolet. Crosby broke the steering knuckle of his car and went out in the sixty-seventh lap.

The remarkable feature of Patterson's race was the fact that he did not go to the pits once during the entire 150 miles. His Goodyear cord tire barely showed signs of wear even after the long grind. All of the first four cars were mounted on Goodyear cords. All of the entrants were tuned and performed well. Speedway officials handled the race well and there were no annoying managerial mistakes.

These who started and the order in which they got away were: Durant, Chevrolet; Patterson, Hudson; Parsons, Seattle special; Roades, Hudson special; Crosby, Duesenberg; Bales, Majestic special; Malcolm, Hudson; Hanson, Hudson special; Price, Duesenberg; Latta, Romano special.

# U. S. Aircraft Production Board

## Body Which Is Intrusted with Making America Supreme in the Air



A. C. Cable, Sec.  
R. L. Montgomery

S. D. Waldon

E. A. Deeds

Rear Admiral  
D. W. Taylor

Brig. Gen.  
Geo. O. Squier

Howard Coffin,  
Chairman

U. S. Aircraft Production Board of the Council of National Defense in Session

SO rapidly has the importance of the Aircraft Production board of the Council of National Defense increased with the amazingly rapid expansion in the aviation program of America that it has assumed a position foremost in the war program of the country. It is believed that a concise presentation of the functions and personnel of the Aircraft Production board will prove of interest.

Relations of this board to the Council of National Defense and to the other sections and boards of the council is shown graphically on other pages. Sufficient to say here that it is one of thirteen special boards, subsidiary to the Council of National Defense, each having been charged with carrying forward some particular line of operation of the national program. The Aircraft Production board was brought into being on April 12 this year by a resolution passed by the Council of National Defense, by which Howard Coffin, vice-president of the Hudson company, and a member of the Advisory Commission of the council, was made chairman of the Aircraft Production board, and was empowered to select the other members of the board.

The purpose of the board was stated briefly in the resolution as follows:

The function of this board shall be to consider the situation in relation to the quantity production of aircraft in the United States, and to co-operate with the officers of the army and navy, and of other departments interested in the production and delivery to these departments of the needed aircraft in accordance with the requirements of each department.

Members of the board besides Chairman Coffin are: George O. Squier, Chief Signal

Officer, U. S. A.; Rear Admiral D. W. Taylor, Chief of the Bureau of Construction, U. S. N.; S. D. Waldon, former vice-president of the Packard Motor Car Co.; E. A. Deeds, former general manager of the National Cash Register Co., later with the Dayton Engineering Laboratories Co. and head of the Miami Conservancy District formed to guard against a repetition of the Dayton flood, and R. L. Montgomery, senior member of the Philadelphia firm of Montgomery, Clothier and Taylor, who will serve as financial and business advisor of the board.

### Co-operates with War Department

The Aircraft Production board acts in the closest co-operation with the War and Navy Departments, especially with the Joint Army and Navy board on design and specifications, which has been entrusted by the two secretaries with discretion on all questions of design and specifications in all forms of military aircraft except Zeppelins. The membership of this joint board includes the following: Major B. D. Foulois, U. S. A.; Capt. V. E. Clark, U. S. A.; Liet. A. K. Atkins, U. S. N.; Liet. J. H. Towers, U. S. N.; Asst. Naval Constructor J. C. Hunsaker, U. S. N.; Capt. E. S. Gorrell, U. S. A. Henry Southor, the consulting engineer of the Signal Corps, acts in a similar technical capacity to the Aircraft Board.

The general function of the Aircraft Production board is to bring manufacturers together and help make their resources available to the Government and assist the Government in stimulating the production of

better types and greater quantities of air machines, to investigate and recommend manufacturing plants where orders are to be placed, to aid in arranging with American factories as to the kinds of machines best suited to their several organizations and facilities for manufacture, to advise as regards priority of deliveries of aircraft material in accordance with a general policy as determined by the Council of National Defense, and following the selection of sites for aviation schools and supply depots by the military department, to advise in regard to buying or leasing the land, preparing it for use and erecting all buildings.

Duties of the Aircraft Production board, as prescribed in the resolution which brought it into existence, are as follows:

1. **ENGINEERING:** To co-operate with the Plane and Engine Design Departments of the Army and Navy, with all manufacturers, engineering laboratories, private individuals, etc., to advance the science of aviation and aerostation and to stimulate the production of a better type of aircraft.
2. **SPECIFICATION AND STANDARDIZATION:** To advise and assist in such standardization of material and parts and as far as is practicable, of types of aircraft as will aid in increasing the productive capacity of the industry in the most efficient forms of aircraft.
3. **PRODUCTION:** 1. To investigate the source of supply of air craft of all kinds and the materials entering into them and to assist in the formulation and execution of such plans as may be necessary to enable the Government to purchase all kinds of aircraft of the types and in the quantities desired.

This will cover advice in connection with:

- (a) Co-ordination of designs of all aircraft matters through the officers of the allied countries stationed here for that purpose.
- (b) Arrangements with existing



American factories as to kinds of aircraft best suited to their organizations and facilities and quantities to be built by them.

(c) Suitable arrangements when necessary to advance Government funds where larger contracts are considered than can be privately financed or to make arrangements on a cost-plus basis.

(d) Utilization of such idle facilities and creation of such new sources of supply as in the judgment of the Board are necessary to meet the needs of the Government.

4. **INSPECTION:** To co-operate with the inspection organizations of the Army and Navy and to assist in co-ordinating their present systems of inspection to the end that if possible there be one system, one standard and one organization for the inspection of aircraft in this country.
5. **AVIATION SCHOOLS:** Following the selection of sites by the Military Departments, to advise in regard to buying or leasing the land, preparing it for use, and erecting all buildings.
6. **SUPPLY DEPOTS:** Following the approval of sites, to advise in regard to leasing the land, erecting the necessary buildings.
7. **PRIORITY:** To advise as regards priority of deliveries of aircraft material in accordance with a general policy as determined by the Council of National Defense.

The immediate policy of the board as originally planned involved roughly a program for the first year of turning out in American factories about 3500 airplanes, including both training and battle types, and the establishment of schools and training fields with sufficient capacity not only to man these machines but to supply a constant stream of aviators and mechanics to the American forces in Europe. Within the last few weeks, however, indications have pointed to a greatly enhanced program for production of airplanes, and definite steps toward the production of a number considerably in excess of 3500 is probable.

Under the auspices of six of the nation's leading engineering schools, the cadets already are under preliminary training for the American military air service, and construction work is going forward on three of the twenty-four training schools which are contemplated.

#### WHO GUILTY, GARAGE OR OWNER?

Austin, Tex., July 7—The State Court of Criminal Appeals has just rendered a decision declaring invalid the law which was passed by the legislature at its recent session, providing that every repair shop of whatsoever kind or garage within the state engaged in repairing, rebuilding or repainting of cars of every description, or any repair shop engaged in electrical work in connection with cars shall keep a register of every material, repair or change in or on any car and providing that a failure to comply with the act shall be a misdemeanor, and prescribing penalties.

This action was taken by the court on the last regular opinion day of the term which closed last week.

The court held that nowhere within the terms of the act is a punishment denounced against any citizen of the state. It applies only to a garage and such things as are mentioned in the quoted act. Under no terms or phase of this act does it apply to persons. The whole thing has entire ref-

erences to garages, repair shops and electrical works. The punishment is not denounced against anything except those defined in the act.

"By no sort of ordinary language can a garage be a person," says the Court of Criminal Appeals, speaking through Presiding Judge Davidson, "nor is the individual citizen of Texas to be regarded by the language of this statute as a repair shop or electrical works. He may be the manager or owner, but he is not the shop; he is not the garage."

The declaration of the invalidity of this act was made in record-breaking time. The act became effective on June 20. The defendants in the case were arrested on June 23 and each fined \$25. Appeal to the Court of Criminal Appeals was perfected on June 27 and the case submitted on June 29. On June 29 judgment was rendered declaring the act of the legislature invalid.

#### \$500 FOR ONE TIRE IN SWEDEN

New Sweden, July 6—Sweden is becoming alarmed by the United States exports plan. The Washington dispatches of the last few days forecasting the sharpest limitation or possible discontinuance of all exports to neutrals has caused anxiety in Government circles. Leather is scarce and motor car tires bring \$500 apiece.

#### FRANCE BARS MOTOR IMPORTS

Washington, D. C., July 6—France has imposed a prohibition on the imports of motor vehicles, according to an announcement made by the Department of Commerce to-day. The department publishes the following cable from the American Consul General in Paris:

"Decision of Minister of Armament and War Material, upon advice of Interministerial Committee on Woods, Metals and War Material, published July 1, provides that no further import permits for lorries

—trucks—and motor cars will be granted, except to manufacturers producing proof that vehicles were shipped directly to France and Algeria before publication of decision."

#### ST. LOUIS FORD AGENTS OUT?

St. Louis, Mo., July 9—A generally accepted report here says that seven of the sixteen local Ford dealers will be dropped Aug. 1. Whether they will be replaced is not a part of the report. The assembly plant declines to discuss the situation.

#### LEE CORD TIRE POSSIBLE

Conshohocken, Pa., July 6—The Lee Rubber & Tire Corp. is producing at the rate of 25,000 tires a month. The original plans called for 20,000 per month. The company is now experimenting with a new cord tire and it is expected that if the experiments are successful this will be added to the regular tire and the puncture-proof tire now produced. June was the most satisfactory month in the operations of the company so far this year. The company is producing at the rate of 1000 tires per day for five days a week.

#### WILLYS-OVERLAND BREAKS RECORD

Toledo, Ohio, July 6—All retail sales records of Willys-Overland, Inc., were broken last month, when the retail business amounted to approximately \$11,150,000. These figures are for the United States alone and do not include Canadian or export sales, which also are heavier than ever. June 25 reports of the sale of 1075 cars at retail reached the company—\$988,200 worth—a new high mark for a single day's Willys-Overland trading. During the first two weeks in June the daily sales averaged about \$400,000. During the week of June 17 the retail sales climbed to a daily average of about \$450,000.



Back to Dixie—Negro refugees being loaded into motor trucks to escape East St. Louis mobs. They are under military guard

# 370 Miles on 17 Gal. of Gasoline

## Franklin Wins in Contest of California Dealers—White Second with 32 Gal.

LOS ANGELES, Cal., July 5—Trekking 370 miles over boulevards and dirt roads, crossing four mountain ranges and three deserts, starting at sea level and reaching an altitude of 8000 ft., seventeen motor cars carrying seventy-six passengers returned here after making a gasoline economy run to Camp Curry, Yosemite Valley, in which fourteen of the cars competed. The contest was decided by the record of gasoline consumption on the ingoing trip, the return not being computed. All the cars covered 800 miles or more from the time of leaving the city until their return.

This was one of the severest tests of economy to which motor cars have been put in competition in this country and probably in the world. For those who do not understand the geography of California, it will be difficult to comprehend just what conditions these cars met. Motor car manufacturers, had there been any on the trip, would have had brought home to them what it is that the California owner demands of his car, for thousands of them make the Yosemite run each year.

The competing cars were divided into classes based upon their factory selling price. They had to be stock machines and entered by the Los Angeles dealer. There may be a lesson in the fact that only fourteen of the sixty different makes of passenger vehicles represented in Los Angeles tackled this opportunity of showing their worth and economy of operation. Every car that started arrived at the park,

only two failing to make the final control at Camp Curry within the time limit. One of these was the Woods Dual Power, which was making a better ton-mileage showing than any of its rivals until the hard going in the high Sierras was reached. The little 10-hp. engine could not store up electricity as fast as it was consumed in the propulsion of the car on the steep grades. When the Woods was in trouble for this reason, the driver of the Detroit, which also is represented by the Woods dealer, gallantly forsook his own chances to do the good samaritan act.

The contest was won by a Franklin

### Standing of Cars

#### CLASS A—CARS LISTING AT \$2,000 OR MORE

	WEIGHT	PASS.	GAL.	TON
Franklin Brougham	3450	4	17	37.6
White (16-valve)	5680	5	32	32.8
Winton "48"	5610	5	33 3/4	30.8
Standard 8	4670	5	29	29.8
Marmon	4350	4	28 1/2	28.3

#### CLASS B—CARS LISTING AT \$1,001 TO \$1,999

Monroe	3150	3	16 1/4	35.8
Chalmers	4050	4	24 1/2	30.6
Liberty	3150	2	23 1/2	24.8

#### CLASS C—CARS LISTING AT LESS THAN \$1,000

Dort	2730	3	14 1/2	35.4
Saxon	3020	4	17	32.9
Chevrolet	2720	4	15 1/2	32.5
Pullman	3430	4	20 3/4	30.6

Woods Dual in Class A and Detroit in Class B failed to reach final control within time limit.

Ton mileage determined by multiplying weight of car and load by distance traveled, divided by 2000 lbs., and this result divided by gasoline consumption.

brougham driven by Ralph Hamlin, the local dealer and hero of many a speed battle in the olden days of road racing. This probably was the first time that a car of this type ever has been selected to compete in an economy contest and never before has one been called upon to undergo such a test. Hamlin made the run carrying three passengers and covered the 370 miles into the valley on 17 gal. of gasoline. On the ton-mileage basis he not only won the class in which he competed, but the Franklin made a better showing than any other car that participated. The entry of the brougham was a surprise to all contestants but was decided upon by Hamlin to compete against cars selling for more than the Franklin touring car and increase the weight factor.

Ton-mileage for a passenger car economy contest is questionable as a basis, but it may be as fair to one as another. It is certain that the light car is at a disadvantage unless it makes a truly phenomenal showing on gasoline. For example, the ton-mileage of the White car that weighed 5680 lb. was 32.8 and that of the Saxon was 32.9. The Saxon weighed only 3020 lb., carried but one less passenger and made the trip on 17 gal. of gasoline, while the White required 32 gal. of gasoline.

Two days were devoted to the trip, the noon stop on the first day being at Bakersfield, 127 miles from Los Angeles. After crossing the Tehachepi mountains over the famous Ridge route, a region was encoun-



Seventeen cars made the 370-mile drive in two days on the Los Angeles-Yosemite gasoline economy run, crossing four mountain deg. to melting snow. The cars





The three winners—Presentation of cups to drivers of Franklin, Monroe and Dort cars by Foster Curry, son of man whose exploitation helped make Yosemite Valley famous

tered where it was so hot that the birds nest in the ground and county employees haul water to the trees struggling for existence. The afternoon lap from Bakersfield to Fresno through the celebrated Kern county oil fields, where derricks are as thick as pickets on a fence, was at an hour of day when heat was at its worst.

A day's run of 130 miles means nothing over boulevards, but to those on the economy run it had an entirely different significance, as all of it but 21 miles was "on the dirt," as the expression is in Cali-

fornia. From Madera to Coarse Gold, the country is rolling with rock escarpments that litter the fields and a climb of 1500 ft. is made in 20 miles. This is the locality of such names as Grub Gulch, Fresno Flats and Happy Camp, which usually signifies a store, a well and a blacksmith shop that now bears the title "garage." The last named is at an elevation of 5000 ft., and the road threads its way beneath towering pines, constantly clinging to the summit of the ridge.

The enchantment of the Mariposa grove

of Big Trees made all thoughts of gasoline economy forgotten, and there was much unnecessary running about of cars to get them in favorable locations for taking pictures. Just beyond Wawona, the government takes charge and exacts a fee of \$5 from each car. At Inspiration Point, where the motorist gets his first view of Yosemite Valley, he is warned there is a downgrade of 2000 ft. in 3 miles and he must not proceed faster than 8 m.p.h. There was no chance to save gasoline by coasting here, as it is safer to keep the engine going.



chains and three deserts, ascending from sea level to an elevation of 8000 ft. and encountering climatic changes ranging from 110 carried seventy-six passengers

## Aircraft Designs Ready

### Work on Plans for Planes and Engines Shows Rapid Progress

#### Standardization Will Be Keynote in Manufacture of Motors

WASHINGTON, July 6—E. A. Deeds of the Aircraft Production Board of the Council of National Defense is authority for the statement that designs as to planes, engines, etc., which will be used in the making of the great aircraft fleet, the manufacture of which will soon begin for the government, are fast nearing completion and that the great mass of detailed work which has accompanied final decisions as to technical matters in connection with the same will, he believes, bear excellent fruit. Mr. Deeds said that samples of foreign planes and motors and those on this side presenting features which have appealed to members of the aircraft board, are being standardized and both a plane and an engine of superior workmanship and merit are expected.

Asked if it is true that the board has requested a canvass of concerns competent to manufacture airplane accessories, Mr. Deeds replied, "We have done no such thing." Mr. Deeds said that early in the life of the Council of National Defense a complete survey of the industries of the country was made, that data touching the utilization of such industries, should the government need to do so, could be placed on file by the council.

"All we need to do," said Mr. Deeds, "is to refer to this data for any such information desired. We have got all of that we want and have no time to make such a survey even if we were so inclined. It is possible that some casual remark has been made as to the result of conferences either at our request or at the request of the management of some industrial concern, thus leading to the impression that we are canvassing such industry now."

"In this connection I might suggest that the public need not think everybody in the motor car industry is going to get an order for this stuff. From the number who come to us seeking orders, I would imagine, though, that some such impression has been created."

Mr. Deeds, discussing references to airplane accessories, pointed out that there is not much in the way of accessories in an airplane. He said that there are certain technical parts such as tachometers, aneroid, etc., and his board is getting samples of those uses in the field abroad and they are being standardized.

Mr. Deeds pointed out, for instance, that requests are coming in to him for orders to manufacture steering wheels for airplanes, despite the fact that an airplane

has no steering wheel, thus suggesting the misinformation touching aircraft. Mr. Deeds said that such plants as are fitted to make whatever accessories are needed will be called upon in time.

#### CHEVROLET CLEARS ORDERS

New York July 7—Chevrolet Motor closed May with unfilled orders for 8,500 cars, and under the policy of this company of monthly clearing, these orders expire automatically. Notwithstanding increased production in June, amounting to 3,384 last week, indications are that this month will have, like May about 8500 unfilled orders at its close. This company has not passed a single month since last September with orders less than 6,000 not filled.

The company is planning an increased output for July and August. About 540 small models will be built daily in July and about sixty for the larger models. In August the production will be raised to 600 daily for the small model and about 100 for the larger cars.

The present condition of Chevrolet sales in Canada is interesting. The Canadian managers have been getting about sixty small cars daily and fifteen of the larger models. July, August and September will see these stepped up to seventy-five of the 490 model a day, fifteen to twenty of the big four, and eight to ten of the eight cylinder car.

## Fageol Plant Under Way

### California Company Is Building Factory for Production of Trucks and Tractors

#### Two, Three, Three and One-half and Five-Tonners Planned

OAKLAND, Cal., July 6—The Fageol Motors Co. has started work on the first unit of its new factory for passenger cars, trucks and tractors in this city. The plans of the new plant are for a factory capable of producing the several lines of trucks, tractors and cars and will be built in a series of units.

The line of motor trucks which the new factory will produce will consist of 2-, 3-, 3½- and 5-ton models. The following specifications apply to all these types:

Wheelbase, standard 12 ft.; special wheelbases optional; engine, Waukesha 4¼ by 5¾, four-cylinder; lubrication, force feed; carbureter, Zenith; ignition, high-tension magneto; radiator, cellular type cast shell; clutch, Borg & Bock; transmission, three-speed constant mesh type; springs 41 by 2½ front, 56 by 3 rear, Chrome vanadium; wheels, artillery type; rear axle, Timken worm gear, dust proof; front axle, I. B. Timken, Timken bear-



One of the 260 millimeter guns, one of the largest types used by the Italians, is playing an important part in the latest advance of the Italians. A tractor is shown in the photo hauling one of the giant guns up a mountain side. Getting these immense guns into position on a mountain side is one of the hardest tasks faced by the Italian engineers. The big guns were moved and placed into position rapidly during the latest drive on the German forces with the aid of the tractors



ings; brakes, internal on rear wheels; tires, front 34 by 4, rear 36 by 7.

The farm tractor which the Fageol will build is the invention of Rush Hamilton, an expert mechanic and practical farmer who devoted many years to the study and perfection of his machine before turning it over as completed and ready for the market.

It is unlike either the track layer or broad wheel type of tractor, or the convertible motor car tractors in common use today, using an entirely new principle for getting traction. Instead of flattening the ground in front of the plow or harrow or other machinery being pulled, this tractor draws its farm implements along after having loosened up the soil by its front wheels with their long blade-like teeth.

These blades, or teeth, on the front wheels of the tractor enable it to walk right over all kinds of ground and, owing to its being built very low to the ground it is claimed the machine can go almost any place the farmer or orchardist wishes to send it. The Fageol factory has acquired the rights to the Hamilton invention and will proceed to make them as soon as the new factory is built and the machinery for same installed.

#### KELSEY WHEEL EARNINGS

New York, July 7—The Kelsey Wheel Co. and subsidiary companies, report for the quarter ended March 31 last, total income of \$373,809, sales, less returns and allowances, etc., of \$2,761,109, and a balance of \$347,352.

## Markle Goes to Republic Resigns Active Management of Chicago Studebaker Distribution

Will Supervise Manufacturing and  
Distributing of Alma Product

CHICAGO, July 9—Lafayette Markle has resigned the active management of his office as president of the L. Markle Co., Chicago Studebaker distributor, to become vice-president and assistant general manager of the Republic Motor Truck Co., Inc., Alma, Mich. He still retains the presidency of the L. Markle Co., and his financial interests in that organization, but will devote his time to the supervision of both the manufacture and general distribution of the Republic trucks, acting as assistant to President Frank W. Ruggles. He began his new duties July 1.

Mr. Markle is one of the best known motor vehicle men in America, having entered this line of business in 1899. He began in the mechanical end and in the service and direction of manufacturing, marketing and distribution has had a round of experience in every department. For five years he handled imported cars in New York for the Central Automobile Co. In 1905 he became mechanical engineer of the Corbin Motor Vehicle Co., holding this position two years. He then became district representative for the Olds Motor Works in the Mississippi Valley and opened

the Oldsmobile branch in Chicago in 1908. In 1910-11, he was Chicago branch manager for the Buick, while in 1911 he took a similar position with the Studebaker corporation. Two years ago he organized and financed the L. Markle Co., taking over the Chicago Studebaker business.

Mr. Ruggles will continue to be the active head of the Republic organization and Milton A. Holmes will continue as general sales manager. The gross business of the Republic Motor Truck Co. is expected to amount to more than \$20,000,000 this year.

#### TO MAKE REYA TRUCK

Napoleon, Ohio, July 6—The Reya Motor Co. has been organized to take over the truck end of the Napoleon Co. and will build a light truck and a 1-ton and 1½-ton attachment. The truck will have a 3¾ by 4½ engine; Dyneto electric starting system; Dixie high-tension magneto; Peru axle; 117-in. wheelbase; standard tread; and Babcock special bodies. Incorporation is with a capital of \$800,000. The officers are: President, J. J. Mullan; vice-presidents, Charles Lang and L. W. Schultz; secretary, W. W. O'Hara; general manager, M. H. Ayer, and treasurer, J. W. Gates.

#### JORDAN ELECTED TO N. A. C. C.

Cleveland, Ohio, July 9—The Jordan Motor Car Co. has been elected to membership in the National Automobile Chamber of Commerce. Membership in the N. A. C. C. is based entirely on the standing of the manufacturer, as to the permanency of the business and as to its importance in relation to the trade as a whole.

## How Motor Cars Saved Verdun

WITH only one available line of railroad more than 400 miles away, French forces battling at Verdun would have fallen before the German attack, had it not been for the uninterrupted and efficient service of motor cars.

How the gigantic feat of feeding and supplying the forces and guns at the Verdun front was carried on, over a single third-class road—

How supreme traffic organization made every revolution of a wheel count for service rendered—

How daring drivers remained at their posts in the face of bursting shells, while workers virtually repaired and rebuilt the roads beneath their moving transports—

*W. F. Bradley, MOTOR AGE'S Special Correspondent at the Front, Will Tell You in MOTOR AGE Next Week*

Don't miss this vivid description of motor cars' part in one of the greatest battles of history, with special photographic and sketch illustrations.

# Designing Farm Tractors

## The Kind of Machine That Should Be Built

*This is the third of a series of articles dealing with the problems to be overcome in producing the vast quantity of tractors essential for increasing the world's food supply. The first article pointed out that a big market awaits a good tractor, that the engine is the principal unit and that it is not possible to set a definite price limit. The second dealt with engine problems and how heavy fuel will affect design.—Editor.*

GENERAL questions of tractor design, and particularly the sort of engines desirable, were discussed in two previous articles. In these matters, while the writer's opinions will not be shared by every one, they are based upon consideration of well-established facts. When we come to discuss the design of tractor transmissions, to the layout of the wheels or the substitute thereof, and suchlike subjects, it is impossible to avoid a plunge into the realm of speculation.

In road vehicles we have had front and rear wheel drive, we have had two, three and four-wheel layouts; we have had four-wheel drive. Time has proved that we can make successful machines of all types and that each type has its special sphere of usefulness. So with the tractor, the multifarious methods of driving may easily all persist; that any one form will oust all others is extremely improbable, however far into the future we may peer.

### Natural System Perhaps Not Best

Because the four-wheel machine with rear-wheel drive has proved to be the best for most road work, an engineer naturally turns to the same system for a tractor, unless he has ideas that lead him away from it. He will use this system unless there is a very good reason for not doing so. But it does not follow that this is the best general system for tractors. It may be that it is, but we ought not to be in too much of a hurry to believe it merely because of past experience with road vehicles. Nor should too much weight be given to the fact that those tractors which are conspicuously the best engineering jobs today have, most of them, the four-wheel, rear-drive layout.

In road vehicles we do not have to trouble much about the weight on the driving wheels either way. That is, we can be sure of enough to give traction, and the road is normally hard enough to support a considerable pressure per square inch of surface. With a tractor, both traction and unit pressure are important; in some instances they are of paramount importance. It is accepted by nearly all tractor engineers that there is certain agricultural work which can be done better by a track-laying type than by any other machine, because it gives the maximum traction with the minimum unit pressure. Where the advantage of the track-layer really begins to be offset by the greater simplicity of the four-wheel

machine is the big question, and to decide it will take some years.

Between the two-wheel drive, on the one hand, and the tracklayer on the other there is room for all sorts of compromise. There are machines with a chain-tread drive and wheels for steering which support a good deal of the weight. There are the so-called drum machines, with essentially one hugely wide wheel; there might conceivably be six or eight-wheel machines. Because these things have not proved good for road work is no reason against their adaptability for the farm.

The tractor is the first self-propelling machine that has ever been manufactured, except on the assumption that it would have some variety of prepared track to carry it. In developing the motor car, railroad experience was of little value because the differences of condition were too great; they are, in actual fact, almost as great between the tractor and the motor car as between the motor car and the locomotive.

The matter is complicated still more because the tractor has to be a road as well as a field machine. In Europe, where the majority of the roads are very smooth macadam or bituminous, a tractor cannot be run on them, unless it has smooth wheels, without doing terrible damage. It is illegal in England to drive on a road with strakes or studs in the tires, and it soon will be in America, without doubt, at least on improved highways. Thus the design of the average tractor will have to be some sort of compromise between the road ideal and the field ideal. Meanwhile, there is opportunity for ingenuity in devising some method for rapidly converting a wheel from rough to smooth and vice versa. Two schemes suggest themselves which have not yet been worked out so far as the writer is aware. One is to attach the studs or tread bars to a loose rim which could be slipped over the smooth rim and held by a half dozen large bolts; the other to provide a smooth rim which would go right over the wheel with its field tread and be held similarly by a few bolts. The latter probably would be the better scheme, because the tractor would not have to carry the field-service rims while on the road, as separate parts; and the larger diameter, which equals an increase in gear, would be an advantage on the road more than otherwise.

The writer has mentioned this idea to several tractor engineers, and some seemed rather amused at the thought of any such "complication." The particular idea may be worthless, but for export, at least, the underlying principle is really of very great importance. Remember that in Europe the fields are small, and to get from one to another passage over the roads is necessary. This means that if a tractor works in three fields in a day, as it may easily be required to do, the tread bars and studs will have to be put on and taken off three times, the time occupied being just so much dead waste. The complication of detachable rims, or some corresponding device which could be put on or removed in a matter of minutes, could easily save a couple of hours in a day, and think what 2 hrs. means in terms of work the tractor could be doing.

### Avoid Misleading Simplicity

However, this is a digression. The main idea which it is desired to impress is that the mechanical simplicity and efficiency of two-wheel drive for road vehicles, while it has the same advantages for a tractor, has corresponding disadvantages not apparent on the road. The army wants a certain number of four-wheel-drive trucks because they alone will do certain work; it wants some track-layers, also; it even has limited use for wheeled tractors, although it wants infinitely more two-wheel, rear-drive trucks than anything else.

To give an instance of how the unexpected may occur, it was recently stated in a British paper that it had been found most economical to use a small tractor put on plowing in hilly country after the fashion of the old steam plow. The tractor was fitted with a winding drum and run across the field, leaving the plow behind at the end of a wire rope. Then the winding drum was used to haul the plow, the tractor run back again to the other end and the plow hauled across once more. Apparently the reason for this system being used was the amount of power absorbed by the tractor itself on the upgrade. It is not suggested that such a system is likely to be anything but a makeshift, but it is possible, if not probable, that something of the sort may be best for small fields on steep hillsides, and some of the richest soil in Europe is found in places where the configuration of the land compels the fields to be small.



The conditions in Europe are very important now because Europe is looking to America to supply the large quantity of tractors required during the next few years. A tractor built for efficient work in Iowa or Illinois will have but a limited application in England and in very large tracts in France. If American manufacturers study foreign conditions, and devise machines to suit them, they have a much better chance of holding the tractor trade in their own hands after a few years of peace. Now is the time to follow up closely the machines being shipped abroad, for there will never again be such an opportunity for watching them work under varying conditions, varying soils, varying desires on the farmer's part, preparation for every conceivable kind of a crop.

#### Traction and Weight

That Europe will demand the perfection of a smaller machine than America can use most expeditiously is more than probable. Experience in the United States and Canada will be of greatest value in developing the four-plow and larger tractors, but Europe will be the place to develop the three and two-plow outfits.

This brings up another question of detail concerning which we really know very little indeed, namely, how to get the greatest pull with the least weight. The studs, tread bars, or strakes, as they are variously called, fitted to the rims of driving wheels, must necessarily vary according to the nature of the soil. To get the most economical expenditure of power we need the minimum roughness on the wheel which will give the grip. At present the greatest difficulty is to get enough grip, as, for example, on a grade where the ground is covered with rotting vegetable or animal matter which will form a lubricating compound when squashed. Is it not possible that there may be room for a device somewhat akin to the feathering paddle wheel used on boats? The pedrail has been largely set aside with the coming of the track layer, but this is no reason why it should not have its sphere; do not let it be forgotten.

Of course, the present is not the time to disturb production for the sake of experiment, but in the effort to turn out as many as possible of the best tractors we have there is a danger that we may lose sight of the fact that the present huge demand is due to the abnormal state of the world's food supply. War has made the tractor industry increase ten times as fast as it would have done in peace times.

#### Must Continue to Experiment

In aircraft we have seen an enormous production going hand in hand with an equally astonishing improvement in design. Things are being done in the air today utterly impossible even two years ago. This is because manufacturers, while building to the utmost capacity of their plants, have still continued to experiment with new ideas. So, with the tractor let us continue experiment for greater efficiency, for less weight, for more traction, for more

economical operation. It is, even in present circumstances, better to put 10 per cent of our energies into development and 90 per cent into production than to put the whole 100 per cent into production and let development slide. The 10 per cent of energy in experiment will be returned with compound interest within a couple of years or less.

#### Experiment Offers Promise

It is in general layout that experiment seems to offer the best promise just now. The engines we have are good enough, the transmissions are good enough; ordinary soundness of engineering and workmanship will insure against mechanical breakdown in any part. It is in the utilization of the power available that the greatest opportunity for variation is to be found, and there is herein enormous scope for inventive ingenuity.

## Can Absorb 20,000 Agricultural Prosperity Depends on Tractor Production Abroad for Next Few Years

PARIS, June 15—France can absorb from 17,000 to 20,000 agricultural tractors during the next four or five years, according to Max Ringlemann, a member of the Agricultural Academy and one of the leading agricultural experts of France. The number of tractors now in use does not exceed 1000, of which 500 are in the hands of private owners and an equal number owned by the state.

The production or the purchase abroad of the 20,000 tractors is essential to the agricultural and national prosperity of France. War losses have been greater among workers on the land than among any other profession, for while workers in metals and wood have to a large extent been mobilized in their original occupations, the farm element has been drawn on freely, leaving the cultivation of the land to women and to old men inapt for military service. At the present time the agricultural authorities are asking for 200,000 laborers. Not only has the available amount of labor been reduced, but the losses of horses and oxen have been enormous. This is so clearly recognized that the military authorities recently have made arrangements to hire army horses to farmers and others requiring them. But the problem will not be solved with the end of the war, for animals cannot be brought to the pre-war standard for a number of years. Exactly how long a time must elapse it is difficult to say, but as an indication it may be mentioned that after the Franco-German war of 1870-71 France was ten years in reconstituting her supply of draft animals. Official figures show that 3,000,000 farm workers have passed into the army and that 2,000,000 horses have been withdrawn from their ordinary work.

It is estimated that half of the 14,000,000 head of cattle possessed by France in 1914 have been slaughtered to date.

Before the war France grew 4,900,000 tons of wheat, which amount was sufficient for her home requirements. In 1914 the production was 3,850,000 tons; in 1915 it had dropped to 3,050,000, and in 1916 stood at 2,900,000 tons. This year 6,200,000 acres are out of cultivation. The only remedy is the use of agricultural tractors on a large scale, and as France cannot produce these tractors at the present time, America must provide them.

More official agricultural tractor trials are to be held under the control of the Agricultural Department of the French government. The place selected is Mettray, in the Touraine district, and the date July 5 to 8 inclusive. These trials differ from any others by reason of the work having to be done in vineyards and among other aligned plants. Two classes of land have to be worked on, one being practically level, the gradient not exceeding 2 per cent, and the other on slopes with gradients as high as 8 per cent. Among the practical tests are plowing to a depth of 3 and 4 in., and surface treatment of the soil by such machines as Canadian harrows, etc. The distance between vines is 60 in.; potatoes 31 in., beans 29 in., beets 28 in., and Indian corn 15 in. The trials are open to all Allied and neutral manufacturers. Fuel and oil will be provided free and reduced rates granted on the railroads. In some cases the expenses of the operators will be allowed.

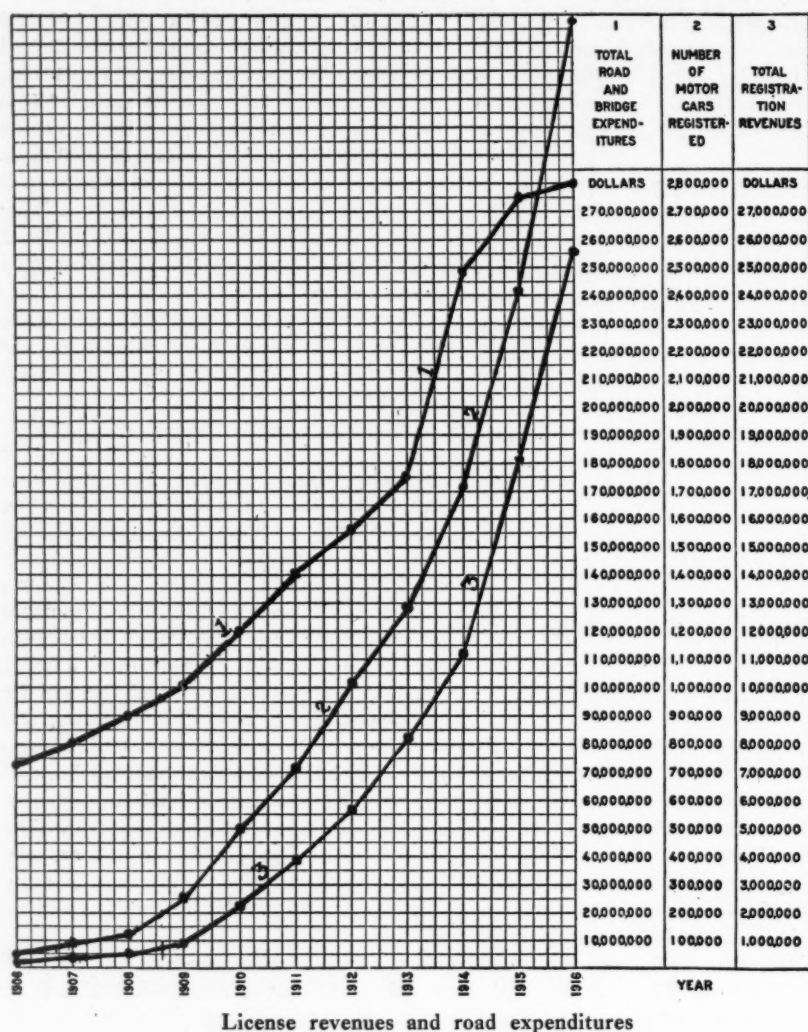
#### MEXICO LEVIES IMPORT DUTY

Laredo, Tex., July 6—The new import duties which the Mexican government placed upon motor cars and accessories went into effect yesterday. These duties are so heavy as to be almost prohibitive and to reap the benefits of the free entry of cars and accessories, many dealers and individuals in Mexico placed large rush orders in the United States as soon as it was announced that the duties would be increased. The total number shipped into Mexico during May, exclusive of those that entered through the ports of Tampico and Vera Cruz, was approximately 2,000. According to advices received here from the City of Mexico, Monterey, San Luis Potosi, Guadalajara and other of the larger cities, many agencies and garages have been opened already, and if the dealers can obtain cars from the United States, they will do a good business.

The use of motor trucks in the oil fields around Tampico and Tuxpam is becoming very general and the necessity of building new highways and improving the existing ones has been impressed upon the government.

The action of the Mexican government in removing all import duties on gasoline and other petroleum products is expected to bring about a material lowering of the price of these commodities in that country.

# How the 25 Million Registration Fees Are Expended



## Nearly All Goes for Road Improvement

DETAILED figures of the registration of motor vehicles in the United States last year which were discussed in general in MOTOR AGE issue of July 5, developed some interesting comparisons. As told last week, the figures show that 1,067,333 more motor cars were registered last year than in 1915, this being an increase of 43 per cent, and the total of passenger and commercial cars was over three and a half million. An interesting item is that 92 per cent of the funds collected in license fees have been applied directly to road building and maintenance, and there has been a very marked tendency to place the expenditures of the motor vehicle revenues directly in the hands of the state highway department. How this money has been expended on road work is shown in the chart on this page.

In the following twenty-one states all, or the major portion, of the net motor vehicle revenues of 1916 were expended by or under the supervision or direction of the state highway department: Arizona, Connecticut, Illinois, Kentucky, Maine, Massachusetts, Maryland, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont and Virginia.

In seven states one-half to one-quarter of the state motor vehicle revenues were expended either by or under the direct supervision of the state highway department, and the remainder by the local authorities. These states are: Arkansas, California, Colorado, Idaho, Michigan, New Mexico, and Wisconsin. In Iowa, Florida, and Tennessee a certain portion, varying from 5 to 15 per cent of the motor

Table I.—Motor Vehicle Registrations, Licenses and Revenues, 1916

State	Motor cars	Motor trucks and commercial vehicles	Motorcycles	Owners' and chauffeurs' licenses	Manufacturers' and dealers' licenses	Motor vehicle fines and penalties turned into state fund	Total gross motor vehicle registration and license revenues	Motor vehicle revenues available for road work		Average gross revenue return per motor car registration	Population per motor car	Motor cars per mile of public rural road
								By or under state highway department	Under direction of local authorities			
Alabama	17,745	3,891	1,398	1,500	105		\$ 203,655.00			\$9.41	108	0.4
Arizona*	11,600	700	1,200	750			73,000.00	\$ 73,000.00		5.93	21	1.0
Arkansas	15,000	(†)	(‡)	(§)			150,000.00	75,000.00	75,000.00	10.00	116	.3
California	232,440	(†)	30,994	14,730	1,781		2,192,699.24	964,784.66	964,894.65	9.43	12	3.8
Colorado	43,296	(†)	4,731	6,754	1,575	\$ 63.00	197,794.75	90,250.33	90,250.33	4.56	22	.9
Connecticut	48,289	7,759	4,900	71,980	401	15,360.87	768,727.91	768,727.91		13.71	22	4.0
Delaware	7,102	(†)	694	8,060	418		85,249.00			12.00	30	1.9
District of Columbia...	12,218	900	921	10,833			47,624.00			3.63	27	..
Florida	20,718	(†)	700	(§)			127,176.00	18,815.00	105,493.00	6.02	43	1.1
Georgia	46,025	(†)	1,852	3,653			154,735.30		106,928.75	3.36	62	.6
Idaho	12,999	(†)	754	1,094	284	10.75	213,758.00	53,439.50	160,319.50	16.52	33	.5
Illinois	248,429	(†)	14,931	33,022	2,871		1,236,566.35	1,236,566.35		4.97	25	2.6
Indiana	139,065	(†)	10,670	3,920	960		817,284.50		796,906.00	5.87	20	1.9
Iowa	198,587	(†)	6,922	(  )	2,774		1,776,170.05	88,808.50	1,598,553.00	8.94	11	1.9
Kansas	112,122	(†)	7,211	(  )	2,245		585,762.00		543,248.00	5.22	16	1.0
Kentucky	31,500	(†)	1,590	1,814			184,740.74	161,674.70		5.86	75	.5
Louisiana*	16,200	800	900	(  )	200		112,000.00		100,000.00	6.60	107	.7
Maine	28,981	1,991	1,284	34,834	351		363,562.25	363,562.25		11.73	25	1.3
Maryland	39,419	4,826	5,115	27,113	1,755	16,466.81	565,302.39	509,471.17		12.77	31	2.7
Massachusetts	118,455	18,354	10,713	171,596	1,977	52,999.14	1,602,958.20	1,449,038.43		11.70	27	7.3
Michigan	148,635	11,417	8,951	11,282	682		1,739,343.62	931,741.61	805,602.01	10.86	19	2.1
Minnesota	146,000	(†)	2,200	4,100	430		82,469.00	65,662.00		1.79	49	.5
Mississippi*	24,000	1,000	800	(  )			175,000.00		125,000.00	7.00	78	.5
Missouri	103,587	(†)	4,278	9,938	1,251		439,315.00	439,315.00		4.24	33	1.1
Montana	24,580	525	695	23,699	293		52,768.00	49,603.00		2.10	18	.6
Nebraska	101,200	(*)	3,867	(†)			311,334.00		275,000.00	3.07	13	1.2

\*Approximate; exact data not obtainable.

†Included under motor cars.

‡Registration not required.

§No date.

||License not required.

¶Registration 1916; total number of cars, approximately, 138,000.



vehicle revenue is designated for the maintenance of the state highway departments, while the remainder is expended on local road improvements. The thirteen states in which the state government exercised no appreciable or direct supervision or control over the manner of expending any of the net motor car revenues, and which are not included in the above three classes, are Georgia, Indiana, Kansas, Louisiana, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, Oregon, South Dakota, Washington, and Wyoming.

As the number of motor vehicles registered under the general designation of motor cars, motor trucks, and commercial vehicles in continental United States in 1916 was 3,512,996, and the total road mileage of the United States outside of incorporated towns and cities was 2,445,761 miles, there was an average of 1.4 motor cars for each mile of rural public road in the United States. But the distribution of the motor cars among the several States was far from uniform. There was only about one motor car for every 3½ miles of rural road in Arkansas, while in Massachusetts and New York there were 7.3 cars per mile of such road, and in Rhode Island the density reached 9.8 cars per mile. While there was an average of one motor car registration for every 32 persons in the United States, in the State of Iowa there was 1 for every 11 persons, but only 1 for every 116 in Arkansas.

While there seems to be a general tendency to increase the registration fees required for motor trucks, there is as yet no well-developed and definite basis for determining in a logical manner the fees to which the different cars shall be subject.

Table II.—Motor Car Registrations and Gross Motor Vehicle Revenues, 1913 to 1916

	Motor car registration*				Total gross revenues			
	1913	1914	1915	1916	1913	1914	1915	1916
Ala. ....	5,300	8,672	11,634	21,636	\$ 83,000	\$ 113,202	\$ 180,744	\$ 203,655
Ariz. ....	3,613	5,040	7,763	12,300	27,545	34,077	45,579	73,000
Ark. ....	3,583	5,642	8,021	15,000	17,411	56,420	80,551	150,000
Cal. ....	†100,000	123,504	163,797	232,440	75,000	1,338,785	2,027,432	2,192,699
Colo. ....	13,000	17,756	28,894	43,296	60,833	80,047	120,801	197,795
Conn. ....	23,200	27,786	41,121	56,048	316,667	406,623	536,970	768,728
Del. ....	2,440	3,050	5,052	7,102	24,735	35,672	55,596	85,249
D. C. ....	4,000	4,833	8,009	13,118	13,228	20,147	29,396	47,624
Fla. ....	\$3,000	\$3,368	†10,850	20,718	\$6,000	\$6,736	†60,000	127,176
Ga. ....	†20,000	20,915	25,000	46,025	12,000	104,575	125,000	154,735
Idaho ..	2,113	3,346	7,071	12,999	35,160	58,580	121,259	213,758
Ill. ....	94,656	131,140	180,832	248,429	507,629	699,725	924,906	1,236,566
Ind. ....	45,000	66,500	96,915	139,065	150,345	432,809	587,318	817,285
Iowa ....	70,299	106,087	145,109	198,587	787,411	1,040,136	1,533,054	1,776,170
Kan. ....	34,550	49,374	72,520	112,122	186,066	268,471	387,588	585,762
Ky. ....	7,210	11,766	19,500	31,500	52,000	85,883	117,117	184,741
La. ....	†10,000	†12,000	11,380	17,000	†10,000	†12,000	75,600	112,000
Me. ....	11,022	15,700	21,545	30,972	138,509	192,542	268,412	363,562
Md. ....	14,217	20,213	31,047	44,245	150,000	268,231	386,565	565,302
Mass. ....	62,660	77,246	102,633	136,809	764,154	923,961	1,235,724	1,602,958
Mich. ....	54,366	76,389	114,845	160,052	190,329	(†)	373,833	1,739,344
Minn. ....	46,000	67,862	93,269	†46,000	40,000	132,398	†160,540	82,469
Miss. ....	†3,850	5,694	9,669	25,000	.....	51,146	76,700	175,000
Mo. ....	38,140	54,468	76,462	103,587	173,510	235,873	323,289	439,315
Mont. ....	5,916	10,200	14,540	25,105	12,000	27,000	33,120	52,768
Neb. ....	13,411	16,385	59,000	101,200	26,000	34,325	†183,000	311,334
Nev. ....	1,091	1,487	2,009	4,919	3,323	4,331	7,875	20,116
N. H. ....	8,237	9,571	13,449	17,508	152,834	185,288	257,776	344,434
N. J. ....	51,360	62,961	81,848	109,414	661,446	814,536	1,062,923	1,406,806
N. M. ....	1,898	3,090	5,100	8,228	15,084	19,663	29,625	47,865
N. Y. ....	134,495	168,223	255,242	314,222	1,275,727	1,529,852	1,991,181	2,658,042
N. C. ....	10,000	14,677	21,000	33,904	60,000	89,580	123,000	206,101
N. D. ....	15,187	17,347	24,908	40,446	41,961	55,964	79,245	125,283
Ohio ....	86,156	122,504	181,332	252,431	457,538	685,457	984,622	1,286,405
Okla. ....	†3,000	13,500	25,032	52,718	3,000	13,500	154,892	555,011
Ore. ....	13,975	16,447	23,585	33,917	56,873	77,592	108,881	146,232
Pa. ....	80,178	112,854	160,137	230,578	841,062	1,185,039	1,665,276	2,325,057
R. I. ....	10,295	12,331	16,362	21,406	129,851	157,020	206,440	264,737
S. C.† ..	10,000	14,000	15,000	†25,000	10,000	14,000	15,000	10,000
S. D. ....	14,457	20,929	28,724	44,271	89,170	125,000	†180,000	140,746
Tenn. ....	†10,000	†19,769	†7,618	†30,000	†9,000	39,538	†34,000	186,953
Tex.† ..	32,000	40,000	40,000	†125,000	16,000	20,000	20,000	20,000
Utah ....	4,000	2,253	9,177	13,507	3,000	4,852	†60,000	93,494
Vt. ....	5,913	8,475	11,499	15,671	111,460	154,267	218,480	297,992
Va. ....	9,022	13,984	21,357	35,426	83,611	120,814	176,875	271,266
Wash. ....	24,178	30,253	38,823	60,734	48,356	60,506	238,717	350,052
W. Va. ....	5,144	6,159	13,279	20,571	40,000	60,648	128,952	198,436
Wis. ....	34,346	53,161	79,741	115,645	190,770	293,580	431,977	615,721
Wyo. ....	1,584	2,428	3,976	7,125	7,920	12,140	19,880	35,625

Total. 1,258,062 1,711,339 2,445,664 3,512,996 \$8,192,253 \$12,381,951 \$18,245,711 \$25,865,370

\*Does not include motorcycles nor dealers' and manufacturers' licenses.

†Estimated.

‡Registration law declared unconstitutional.

§State registrations only.

¶Total cars registered under perennial system.

‡Registrations 1915 only.

\*Cars registered during 1916; total number of cars, approximately, 138,000.

°Estimated number of cars in state.

Table I.—Motor Vehicle Registrations, Licenses and Revenues, 1916, Continued

State.	Motor cars	Motor trucks and commercial vehicles	Motorcycles	Owners' and chauffeurs' licenses	Manufacturers' and dealers' licenses	Motor vehicle fines and penalties turned into state fund	Total gross motor vehicle registration and license revenues	Motor vehicle revenues available for road work		Average gross revenue return per motor car registration	Population per motor car	Motor cars per mile of public rural road
								By or under state highway department	Under direction of local authorities			
Nevada .....	4,672	247	200	(†)	.....	.....	20,115.50	.....	.....	4.01	22	4
New Hampshire.....	17,508	(*)	1,919	22,017	189	3,974.82	344,434.10	344,434.10	.....	19.67	25	1.2
New Jersey.....	104,341	5,073	12,209	137,855	914	41,161.00	1,406,806.06	1,377,741.90	.....	12.86	27	7.3
New Mexico.....	8,228	(*)	364	(†)	128	.....	47,864.78	20,477.83	20,477.83	5.82	50	7
New York.....	279,119	35,103	25,842	105,847	2,496	.....	2,658,041.75	2,298,369.06	226,702.12	8.45	32	4.0
North Carolina.....	33,904	(*)	1,750	(†)	346	.....	206,101.15	.....	164,880.92	6.02	71	7
North Dakota.....	40,446	(*)	1,315	(†)	.....	.....	125,283.00	.....	112,337.09	3.12	18	6
Ohio .....	252,431	(*)	21,933	(†)	3,084	.....	1,286,404.50	1,714,713.50	.....	5.05	20	2.9
Oklahoma .....	52,718	(*)	2,058	(†)	1,405	.....	555,011.45	488,787.45	.....	10.53	42	5
Oregon .....	33,917	(*)	3,368	4,019	278	.....	146,232.00	.....	119,987.45	4.31	24	.9
Pennsylvania .....	218,846	11,732	21,439	127,018	6,658	.....	2,325,057.50	2,325,057.50	.....	10.08	37	2.5
Rhode Island.....	18,551	2,855	1,330	29,169	88	8,640.00	264,737.00	.....	.....	12.36	28	9.8
South Carolina.....	†25,000	(*)	1,000	(†)	.....	.....	10,000.00	.....	.....	1.00	65	6
South Dakota.....	44,271	(*)	1,819	(†)	859	.....	140,746.00	.....	120,000.00	3.18	13	.5
Tennessee.....	30,000	(*)	1,800	(†)	100	.....	186,952.76	18,695.28	168,257.48	6.23	76	.7
Texas.....	†125,000	(*)	5,000	(†)	.....	.....	20,000.00	.....	.....	.50	35	.9
Utah .....	13,507	(*)	1,423	929	130	.....	93,494.00	87,612.23	.....	6.92	32	1.5
Vermont .....	14,943	728	725	19,727	155	.....	297,992.43	277,992.43	.....	19.02	23	1.1
Virginia .....	35,426	(*)	1,927	3,000	322	.....	271,266.38	262,438.18	.....	7.66	62	.7
Washington .....	53,953	6,781	6,170	(†)	1,812	.....	350,052.00	.....	350,052.00	5.76	25	1.4
West Virginia.....	20,571	(*)	(†)	314	.....	.....	198,436.09	.....	.....	9.64	67	.6
Wisconsin .....	111,645	4,000	8,958	(†)	1,958	.....	615,721.00	147,003.00	441,011.00	5.33	22	1.5
Wyoming .....	7,125	(*)	(†)	(†)	.....	.....	35,625.00	.....	28,500.00	5.00	25	.5

Totals and averages. 3,394,314 \$118,682 250,820 890,567 \$41,275 \$138,676.39 \$25,265,369.75

\*Included under motor cars.

†License not required.

‡No data.

§Approximate; exact data not obtainable.

¶No state registration; estimated number of cars in state.

‡Registration not required.

\*Partial totals.

## More Prices Go Up

**Chevrolet, Liberty, Oldsmobile  
and Paige Increase Cost to  
Consumer**

**Average Increase About \$100 Per  
Model**

**C**HICAGO, July 10—Car companies continue to increase prices, four concerns announcing raises within the last week. The average raise is about \$100 per car.

### CHEVROLET INCREASES PRICE

Flint, Mich., July 9—The Chevrolet Motor Co. increased the price of its "Model 490" touring car from \$550 to \$635 effective Aug. 1.

### LIBERTY \$155 HIGHER JULY 21

New York, July 6—Prices of Liberty cars will be raised \$155 on July 21. The prices at present are \$1,195 for the two and five-passenger cars, \$1,795 for the coupe, and \$1,395 for the sedan.

### OLDSMOBILES ADVANCE PRICES

Lansing, Mich., July 6—A new schedule of prices for the Olds Motor Works became effective July 1. The advance averages about \$100 a car. Eight-cylinder models now built in touring cars, club roadsters and standard roadsters will sell at a uniform price of \$1,467, while six-cylinder models in touring cars and roadsters will

sell at \$1,185. The five-passenger touring car has been discontinued.

### PAIGE INCREASES PRICES

Detroit, July 6—The Paige Motor Car Co. has increased the prices of its products, effective July 15, as follows: Stratford 6-51, seven-passenger, \$1,495; Fairfield 6-46, seven-passenger, \$1,375; Linwood 6-39, five-passenger, \$1,175; Brookland 6-51, four-passenger, \$1,695; Dartmoor 6-39, two or three-passenger, \$1,175; limousine 6-51, seven-passenger, \$2,750; sedan 6-51, seven-passenger, \$2,750; sedan 6-39, five-passenger, \$1,775; town car 6-51, seven-passenger, \$2,750.

### FOUR RELIABILITY TEAMS

Chicago, July 10—There will be teams from four cities in the Inter-City Reliability Contest leaving Buffalo, July 16, if the Rochester delegation becomes organized as is anticipated. Latest reports from that city indicate that a team of five cars probably will be entered. This will be in addition to the three, ten-car teams from Chicago, New York and Buffalo respectively. The rules are quite strict, but are somewhat along the same lines as those of the Inter-club runs which the Chicago Automobile Club and Chicago Athletic Association have made a classic.

The Chicago contestants leave Saturday morning on a two-day drive to Detroit, from where they will ship by boat to Buffalo, arriving there in time for a technical examination Monday morning. The Inter-city contest takes in Syracuse, Elmira, and other points in New York, beginning and ending at Buffalo.

## U.S. Motor Supply Dept.

**Headquarters to Be Established  
Near Atlantic Seaboard in  
Near Future**

**Will Equip Regiments Going Abroad  
From There**

**W**ASHINGTON, D. C., July 9—A great motor car, truck and motorcycle supply depot is to be established by the War Department at a point somewhere between Richmond and Norfolk, Va. This depot will be used primarily for the storage of motor machines and equipment destined for points abroad. It is understood that it will be one of the most important, as well as one of the largest depots of this kind established anywhere in the country. Its location will be advantageous.

When the movement of National Guard troops to Europe begins, this depot will naturally be called upon to supply these forces with motor equipment. Also, it is probable the National Army forces will be supplied from this depot, regardless of whatever ports these forces embark from. This assertion seems well founded from reports emanating from departments in Washington.

The plan of the Department is said to be to maintain a force of mechanics at this depot, prepared not only to assemble parts of motor machines for shipment abroad, but also to make necessary repairs to machines which have seen service in the various training camps.

# What Do You Know About an Airplane?

**W**HAT do you, Mr. Reader, know about an airplane? The chances are that if somebody spoke to you about the fuselage of a vehicle driven in the air, you might, likely as not, think it to be the aviator himself, his clothes, or what not. Or, can you distinguish a biplane from a monoplane? How many of us are there that know what the helicopter type of aircraft, experimented with several years ago, is. Even now, when you read about the performance of the airplanes in Europe, after names of the various parts of the machine have been referred to from time to time in the reports of the machine's activities, are you sure that you can talk intelligently about elevating rudders, alighting gear, etc.? Perhaps you can, but it is quite likely that most of us will fall by the wayside. But relief is in sight.

In order to bring technical terms applied to the science of flying home to persons not mechanically inclined, and to better acquaint the masses with the underlying principles of construction as applied to airplanes, Motor Age will begin, next week, a department devoted to the A. B. C. of Aviation. It is the intention of this publication to make the text non-technical, so that it will be easily understood. The main idea is to tell what the various parts of an airplane are and what they are for. Aviation is going to be greater than most of us imagine and it is well to get acquainted with it.





# The Motor Car Repair Shop



## Case for Bolts and Nuts

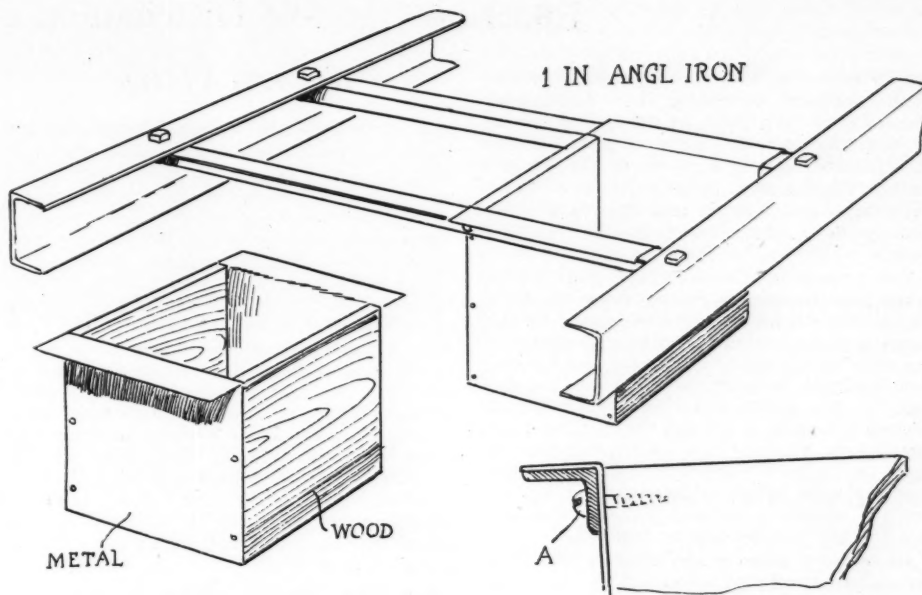
Quite often one enters a repair shop and finds small parts, such as bolts, nuts, grease cups, washers, etc., strewn about the place in great disorder. Usually such parts have been taken off old cars and they are generally heaped into one pile of confusion. If such parts as cotters, washers, etc., are segregated and arranged in small bins according to their sizes, much time will be saved in hunting around for a particular size or shape of the article wanted.

A good way of taking care of these small parts is to build a case, like that shown in the illustration, which has been divided off into compartments. Each compartment is fitted with a sliding container to hold the articles. Under ordinary conditions the articles can be picked out of the containers through the openings in front, but if the articles are small and the bins nearly empty the latter can be drawn out the same as a drawer. The front of each container should be labeled to identify the article easily. Common quarter-round moulding is used for slides for the containers, thus making it necessary to fit vertical divisions only.

## Carrying the Battery

It is sometimes quite a puzzle to know just where to carry the storage battery on cars which have not been previously so fitted. One way is to fasten one of the many battery boxes on the market on the running board. Or, the battery can be placed under the back seat, if the space allows. Perhaps one of the best places is under the floor boards, where suitable brackets can be bolted to the frame of the car from which the battery can be suspended. In this way the weight will be hung low and any slopping over of the battery cells will drip onto the ground through holes cut in the bottom of the carrying box. In order to fit the angle iron supports which are fastened to the car frame properly, the body of the car should be removed. This may seem like a lot of unnecessary work, but once the iron cross pieces are in place, they cannot come loose and the battery will be carried rigidly at all times. The great weight of a storage battery demands that it be properly taken care of and it is well worth the time to build an efficient carrier.

The illustration shows how the angle iron cross pieces are secured to the top flange of the frame with bolts or rivets. The reason they are bolted to the top flange is that the drive shaft tube will clear them better in its upward and downward travel over road inequalities. If, however, there seems to be no danger of the tube striking the angle irons, the lat-



A combination wood and metal storage battery carrier

ter can be bolted to the lower frame flange, which will make it unnecessary to remove the car body, inasmuch as the holes for the bolts can be drilled from underneath the car. After the angle iron supports are in place the box or carrier can be built.

The size and shape of the box will necessarily be determined by the particular battery at hand. The bottom and ends are made of 22 gage metal, bent as shown. The sides of the box are made of hardwood about  $\frac{3}{8}$ -in. thick. Have the grain of the wood running up and down, so that the screws holding the metal ends in place will get a better grip in the fibers of the wood.

Before the angle iron pieces are put in place it is well to drill two holes in each for the round-headed screws, A, which are used to hold the box firmly in place. Several holes are cut in the bottom of the box and two blocks fitted so that the battery will be raised somewhat from the bottom of the box. This will let any water or acid

drain out of the box. When completed the whole thing can be given one or two coats of running gear paint.

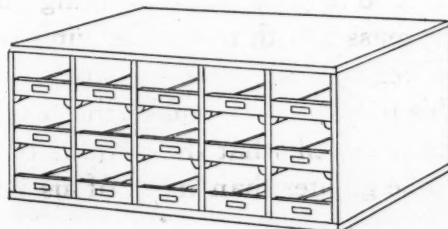
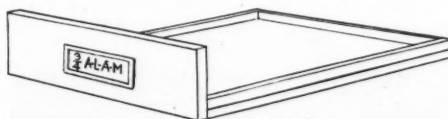
## Some Points On Drilling

Before any drilling is done, it is advisable to get some cooling substance for the drill. For this purpose soda solution or lard oil can be used to good advantage. The drills are hardened to a great degree and should not be operated for any great length of time without being properly cooled. Another thing which some repair men forget to make frequently is a center punch mark for the point where the drill is to enter. Very often a man is seen trying to drill a hole in a shiny piece of metal and needless to say, he has a hard time trying to start the drill in the proper place.

Metal to be drilled should always be examined first to see whether or not it can take the drill. Hardened or tempered metals may take the drill, but the latter may be injured at the same time. It is customary when a hardened piece of metal is to be drilled to soften it first by heating to a red heat and then annealing it in air or sand. After this process the drilling is not difficult. When the drilling is complete, the metal is again hardened.

## WILL NOT MAKE CARS

Beacon, N. Y., July 7—The Morgan Potter Mfg. Co., which recently changed its name to the Morgan Potter Motor Co., to devote its plant to the manufacture of a four-cylinder, five passenger touring car, a light truck and truck converters, has decided to abandon all such plans. It will continue to make brakes for trucks.



A handy case for holding small parts such as bolts, washers, etc.

# Road Illumination by Headlamps

## Experiments With Different Designs and Effect on Glare of Distribution of Light

By Dr. H. P. Gage

THIS is one of a series of contributions to the subject of motor car headlamps. Papers have been given at the lecture course of the Illuminating Engineering Society in Philadelphia, before sections of the Illuminating Engineering Society in New York, Pittsburgh and Boston, and also before the Society of Automotive Engineers in New York.

The ground has been covered from nearly every possible standpoint, including the difficulties and dangers which are caused by the dazzling glare encountered when passing motor cars with bright headlamps, the legislation designed to overcome this evil, the design of the headlamps and description of devices intended to change the natural light distribution produced by the headlamps, the beam candlepower necessary to illuminate the roadway with sufficient intensity for drivers and the necessity for accuracy in construction and the need of care in focusing.

All through these talks has run a serious undercurrent of discussion as to the type of light distribution best suited to the purpose. Generally the problem of light distribution has been left in the form of the question: "If glare is eliminated, what light distribution is best suited for driving purposes?" In the New York meeting of the Society of Automotive Engineers, A. L. McMurtry emphatically declared in favor of a beam of light properly directed or deflected in such a manner as to eliminate glare in preference to the control of glare by the method of diffusion.

### Extent of Road Illumination

In the formal papers so far presented emphasis has not been laid upon the exact extent of the roadway itself which should be illuminated or the question as to exactly how much light thrown in the driver's eyes should be considered as dangerously glaring, and while some suggestions along these lines have been made, it seems to me that a material addition to the subject under investigation can be made by the presentation of some data in the form of photographs which illustrate the method which has been adopted in the laboratories of the Corning Glass Works to study some engineering details required in the consideration of motor car headlamps.

It is a comparatively simple matter in the laboratory to measure the intensity of light projected by a parabolic reflector, either alone or combined with some light-distributing device, and to measure in degrees or in radian measure the extent of the beam. But what do these figures mean when the light projector is fastened to the front of a car and the machine is driven through the dark

at a fairly high rate of speed along a smooth macadam road where many other cars are passing? The answer to this question involves so many elements that we must take each element and analyze it separately. The first consideration would seem to be the type of road which it is necessary to illuminate.

The Type A road is the ordinary country road, on which the motorist meets no obstructions to speak of, and certainly has very little difficulty from glare from any other motor car. The road is rough; he has to look out for ruts, ditches and occasional bridges which may be missing. He only needs a comparatively small amount of light because he cannot travel very fast, yet he can have all the light he wants because there is nobody to interfere with. From the motorists' standpoint this is a very simple proposition because very few motor cars travel on such roads.

The Type B road is the macadamized road, what we call the State road in New York State, because practically all the state roads are macadamized, and vice versa. There are a large number of motor cars on pleasant summer evenings, a constant stream, going in both directions, and there is a great deal of difficulty caused by glare. Sometimes there is a wagon on that road that does not carry any kind of light, or if it does, the light is concealed carefully from both the front and rear, and it is only a matter of legislation that any light at all is carried. There are occasional pedestrians who carry no light on such a road, although if I were the pedestrian I think I would carry a lantern as Safety First precaution.

Then there is the Type C road, the city or independently lighted road. There again the headlamp situation is very simple; headlamps used only as position markers.

Fig. 2 shows the Type B road taken from the headlamp position. The camera equipped with an objective of 11 in. equivalent focus, to secure uniformity with photographs of screen images, is set at a height of 42 in. above the road level. A tape or surveyor's chain is used to measure a distance of 50 ft. from the camera, and a rule held up to measure a height of 42 in. above the road.

The night photographs in Figs. 1 and 3 correspond in position of the camera to the driver's eye.

The statement has been made that in order

to get sufficient road illumination for comfortable and safe driving, a beam of light of such high intensity is required that if this beam of light is directed into the eyes of an approaching driver the glare is so intense that it is highly dangerous in passing. If then it were not possible to so direct the rays of light, that only the road were illuminated, as for example, if a very powerful arc lamp were mounted on the front of the car, a very serious state of affairs would exist and anyone using the highway at night would make himself highly objectionable and dangerous to all of the other users of the highway. If such a state of affairs did exist, it would be necessary to limit the power of headlamps to such a point that the glare produced would not be so great, but that all the users of the road could get by each other, and at the same time they would be able to have enough good illumination to proceed at a slow rate of speed. The question then would be simply one of road illumination versus glare.

If, however, we accept the solution of directing the light toward those portions of the roadway which it is necessary to see, and by keeping strong light intensities away from the pathway which would be followed by the eyes of the drivers of approaching vehicles, the problem becomes more simple. The problem then consists of determining just what light pattern it is the most suitable to project in order to produce this effect, and furnish suitable devices and engineering instructions for their use so that the ordinary driver of motor cars can utilize this light distribution on his car.

### Light Patterns Produced by Projectors

The light pattern projected by a fairly well shaped parabolic reflector is shown in Figs. 4, 6 and 7. In Fig. 4 the filament of the bulb is at the exact focus of the parabola, and in Fig. 6 the bulb filament is 1/10 in. inside this focus, and in Fig. 7 is 1/10 in. in front of the focus. In these photographs the axis of the light beam is represented as the crossing of the two heavy lines. The screen is at a distance of 25 ft. from the headlamps, and the lighter lines are each 1 1/2 ft. from the center lines. In terms of radian measure these finer lines are 6 per cent—6 ft. at a distance of 100 ft. from the center line, or, in terms of degrees they are 3.4 deg. from the axis. If metric measures were used the same results would be secured with a screen 10 m. from the lamp and the fine lines each 60 cm. from the axis lines. What these figures mean with reference to road illumination is not easily understood.

To introduce the road, a double print was made. The negative of the screen image and one of the road negatives both were printed

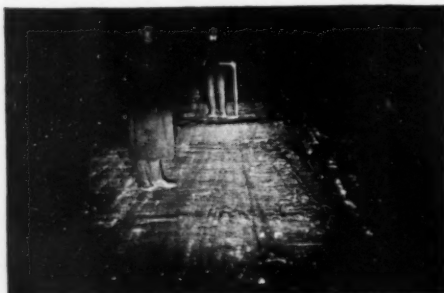


Fig. 1—Night photograph with camera in position of driver's eye

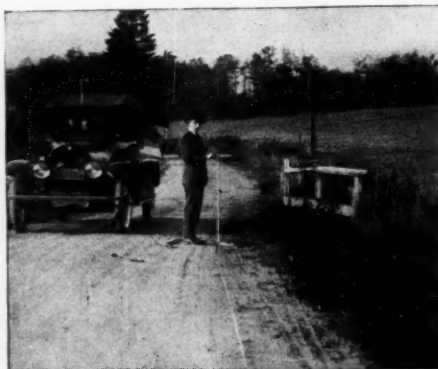


Fig. 2—Type B road from headlamp position

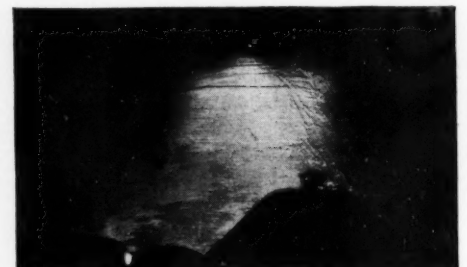


Fig. 3—How headlamp's reflection appears to driver at night

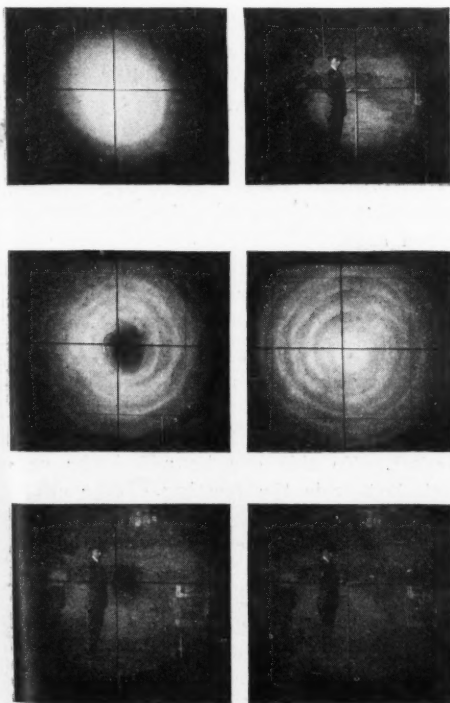


on the same paper, care being taken to print the crossing of the axial lines directly on the bend in the rule, that is, 42 in. above the road level and directly down the road. Those portions of the road which would not receive light directly from the headlamp are black, while those which would be illuminated by the headlamp show the picture of the road. Thus Fig. 7 shows the portions of the road illuminated by a parabolic projector whose axis is horizontal. The light pattern projected by different devices is shown in Figs. 8, 9, 10, 11 and 12, and the portions of the roadway illuminated are shown in the corresponding photographs.

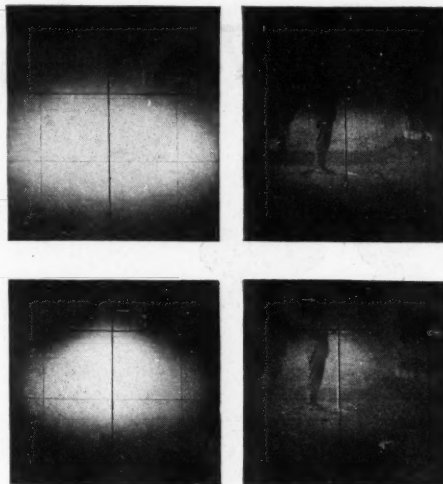
Without mentioning the names of the particular devices which are illustrated here I think it perfectly legitimate to criticize the effects from the standpoint of the driver of the car and from the standpoint of those who are trying to proceed in the opposite direction.

In Fig. 4 it is evident that directly down the road a terrific glare would be encountered, but at a distance of approximately 75 ft. the driver's eye is outside of the direct beam, and little interference would occur from that point to the point of passing. From the driver's standpoint objects at a distance down the road would be seen clearly, but the near objects, such as fences, ditches, etc., are not well illuminated, and in case a car is encountered, which itself produces blinding glare, difficulty will be experienced in passing, as it will be nearly impossible to distinguish ditches and other road characteristics 75 ft. or less from the front of the car.

In Figs. 6 and 7, which illustrate more or less spreading light beams, the intensity down the road is less. It is very difficult for an approaching driver to get outside of the projected beam, and therefore the glare will continue to a point quite close to the car. From the driver's standpoint the distant illumination is less intense, but on the other hand greater spread is obtained and ditches, etc., are rendered more visible. If the headlamps are bent downward, as in Fig. 12, the effect of glare is eliminated. This



Top—Figs. 4 and 5; center—Figs. 6 and 7; bottom—double prints showing road with 6 and 7



Figs. 8 and 9, left, and double prints showing roads illuminated by these light patterns

light distribution is, however, unsatisfactory from the driver's standpoint, as the brightest part of the light strikes the road at a distance of between 50 and 60 ft. in front of the car, and there is insufficient spread to the light beam.

In Fig. 9 we have an illustration of the light beam bent downward and at the same time spread out across the road. This eliminates the troublesome glare, due to light above the horizontal, and at the same time lights up the ditches at the side of the road. This light distribution can be improved upon somewhat by a device which distributes part of the light, Fig. 8, in a fan-shaped beam, and part is directed in an intense beam directly down the center of the road.

In Fig. 10 we have an illustration of light which is projected so far below the horizontal as to illuminate a small path directly in front of the car, but no appreciable amount of light falls beyond a distance of 60 ft. from in front of the car, and the spread is insufficient to see either ditch.

In Fig. 11 is shown a light pattern consisting of two distinct beams of light. The lower beam is intense and is in fact undesirable, as it produces a bright spot of light directly in front of the car in a place where it is not needed, and yet it reduces the sensitiveness of the eye to the more distant parts of the road which are illuminated less brilliantly.

In Fig. 7 we have the type of light distribution obtainable from the diffusing type of covered glass. It is an old saying that you cannot eat your cake and have it too. All who deal with light know that if you have a given amount to start with, you can illuminate a small surface brilliantly or a large surface dimly. It is true that by placing a diffuser in front of a parabolic projector, the glare is reduced, but only to an extent corresponding with the reduction in beam intensity. The same condition holds that holds in the case of Figs. 6 and 7, in which the bulb is not at the focus of the parabola, only to a much greater extent. The driver of an approaching vehicle is in the beam of the headlamp from the most distant point until he is even with the headlamp. If the intensity of the light is insufficient for the driver to see the road, then the driver of the approaching vehicle will experience a blinding glare until the car is actually passing.

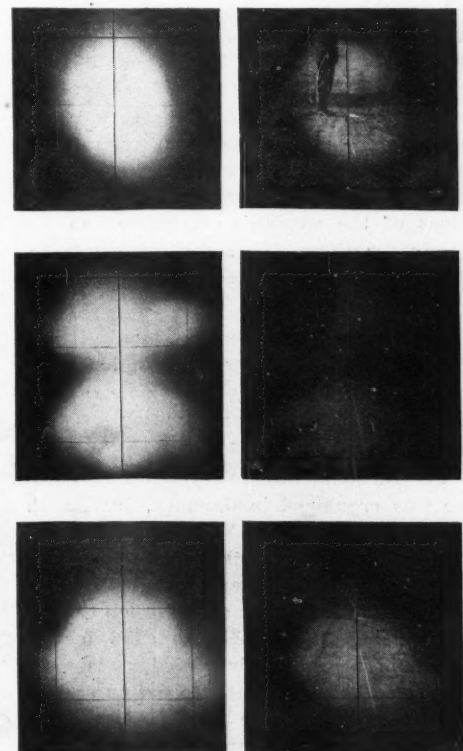
In conclusion I wish to say that the Type B, or macadamized, roads, on which glare is prone to be the greatest obstacle to safety and comfort in driving, are provided and maintained by the State, and their use is,

therefore, legitimately subject to State control for the purposes of securing the greatest usefulness and safety for all users of the highway. In the particular field of the illumination of these roads by portable lamps the legislation now being enacted has some regard for the scientific requirements of illuminating engineering, thanks to the agitation of the motor clubs and the engineering data supplied by the Illuminating Engineering Society, the Society of Automotive Engineers and to a certain extent by the manufacturers of anti-glare devices.

The question of official approval of particular devices has been agitated often, and it has been pointed out that without such approval the owner of a car is at sea and does not know whether his car complies with the law or whether he is subject to arrest by the first traffic policeman he meets.

If a certain light distribution is passed upon as legal without regard to what device is employed to produce such light distribution the responsibility of securing the required light distribution rests with the car owner. As the majority of car owners and even garage men have not familiarized themselves with the laws of optics, a vast amount of education will be necessary before the law can be complied with. The indefinite term "blinding glare" is employed in many ordinances. If all car owners honestly attempted to eliminate "blinding glare" in directions which this glare should not exist I doubt if many cars would present any difficulties in passing.

While there are serious drawbacks to giving official permits to special devices and allowing freedom from police interference to users of such devices, would it not be entirely feasible to give permits stating that when certain devices were properly installed and the headlamps properly adjusted that the ordinance would be complied with, thereby eliminating the many devices which are so crudely designed, that by no adjustment whatever can they be considered as glare eliminators?



Figs. 10, 11 and 12 and double prints showing roads illuminated by these light patterns



# From the Woman's Viewpoint



Here are officers of Philadelphia's motor messenger service, left to right: Miss Richards, second lieutenant; Mrs. C. P. Stokes, second lieutenant; Miss Letitia L. McKim, captain; Mrs. Thomas L. Elwyn, adjutant. They are wearing the uniform of the service. Each drives her own car in the services of various relief organizations

## How America's Women Have Organized

THE organization of the woman power of the country under the woman's committee of the Council of National Defense has spread so rapidly in two months that to-day the work of the registering in a woman's volunteer army for service has actually begun. A national registration card has been prepared. The enlistment is to be made as fast as the state divisions of the woman's committee can get ready for them. In scores of places to-day the women already are demanding registration blanks.

June 5, 10,000,000 men registered. It was the law. It looks now as if at least 20,000,000 women may register before the end of the year in this volunteer army for service. No law is necessary.

The National League for Women's Service was organized in January, 1917, with headquarters in New York. Its object is "to co-ordinate and standardize the work of the women of America along lines of constructive patriotism; to develop the resources and to promote the efficiency of women in meeting their everyday responsibilities to home, to state, to nation and to humanity; to provide organized, trained groups in every community prepared to co-operate with the Red Cross and other agencies in dealing with any calamity—fire, flood, famine, economic disorder, etc., and,

in time of war, to supplement the work of the Red Cross, the Army and Navy and to deal with the questions of woman's work and woman's welfare."

The responsibilities and interests of women have been divided into national divisions: Social and welfare, home economics, agriculture, industry, medicine and nursing, motor car driving, general service, health, civics, signalling, map reading, wireless, telegraphy and camping. Definite work under these national divisions is developed through state and local organizations, the working unit being a detachment of not less than ten nor more than thirty under the direction of a detachment commandant. Nearly 200,000 women now are members of this organization.

The motor corps is one of the most interesting and efficient divisions of the league. A member of this division must meet several requirements for active service. She must have a health certificate, a state chauffeur's license, at least two years' experience in driving and a certificate from a motor school. Infantry drill is compulsory and is held twice a week in one of the city armories in New York. The members also are required to take a course in first aid, which is given once a week at a hospital. The members of the motor corps wear a khaki uniform consisting of a short

skirt, Norfolk coat and cap with visor.

Services performed by members of this division with their cars are numerous. They aid in taking the military census, act as messengers, carry light military supplies and in other ways meet the demands for war service which come through the war department or local military organization.

## Food Conservation

SAMPLE meals for a family of two adults and three children, as worked out by Government food experts:

### Breakfast

Fruit,  $1\frac{1}{4}$  lb. of fresh fruit (equivalent to three medium-sized oranges, five small apples or a quart box of strawberries) or 3 or 4 oz. of dried fruits (equivalent to ten or twelve dates or four or five figs).

Cereal breakfast food, 4 oz. before being cooked, or about  $1\frac{1}{2}$  pt. after it is cooked. The equivalent in food value in puffed or flaked ready-to-eat cereals would be five or six cups.

Milk on cereal,  $\frac{1}{4}$  cup to each person.

Sugar on fruit, on cereal or in coffee,  $2\frac{1}{2}$  level tablespoons or  $1\frac{1}{4}$  oz.

Bread, eight slices, or 8 oz.

Butter,  $1\frac{1}{4}$  oz., or  $2\frac{1}{2}$  cu. in.

An egg or 2 oz. of meat, fish or poultry for each older person and a glass of milk for each young child.

### Dinner

Meat or fish,  $\frac{1}{4}$  lb. per grown person; or, for each child, an egg or a glass of milk.

Potatoes (five medium-sized),  $1\frac{1}{4}$  lb.

Another vegetable (turnips, spinach, corn, cauliflower or other) 1 lb.

Bread, eight slices, or 8 oz.

Butter,  $1\frac{1}{4}$  oz., or  $2\frac{1}{2}$  cu. in.

Steamed apple (or other fruit) pudding. (Ingredients: Two cups flour, 2 tablespoons butter,  $\frac{3}{4}$  cup milk, 4 apples, 1 tablespoon sugar.)

Sauce. (Ingredients: One-half cup sugar,  $1\frac{1}{2}$  tablespoons flour, 2 tablespoons butter,  $\frac{1}{4}$  cup water, flavoring.)

### Supper

A gravy made out of 1 pt. of skim milk,  $\frac{1}{4}$  cup flour, 2 level teaspoons butter and 4 oz. salt or smoked fish (just enough for flavor). To this can be added the egg yolk left from the frosting of the cake. (See below.)

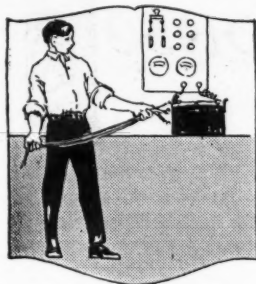
Rice, 8 oz., or 1 cup, measured before being cooked.

Bread, eight slices, or 8 oz.

Butter,  $1\frac{1}{4}$  oz., or  $2\frac{1}{2}$  cu. in.

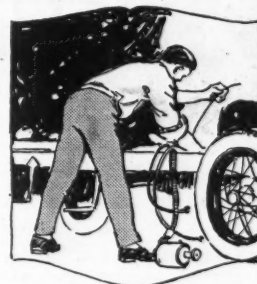
One-half of a cake. (Ingredients for whole cake: One-fourth cup butter,  $\frac{1}{2}$  cup sugar, 1 egg,  $\frac{1}{2}$  cup milk,  $1\frac{1}{2}$  cups flour,  $2\frac{1}{2}$  teaspoons baking powder.) Frosting made with 1 egg white and  $\frac{1}{4}$  cup sugar.





# Electrical Equipment of the Motor Car

*By David Penn Moreton & Darwin S. Hatch.*



**Editor's Note**—Herewith is presented the fifty-first installment of a weekly series of articles begun in MOTOR AGE issue of June 29 designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., in a size to fit the pocket conveniently.

## Part LI—Electrical Instruments

**I**N some cases a charge and discharge indicator is used instead of an ammeter. The operation of these devices is very similar to the instrument shown in Fig. 278, which usually is referred to as the soft iron instrument. When the current passes through the coil in one direction, the moving part is turned in one direction, and with a reversal of current the moving part is turned in the opposite direction. The words "charge" and "discharge" appear when the moving part is in its entrance position. An indicator of this kind is shown in Fig. 286.

The Leece-Neville Co. manufactures an indicator which is a part of the cutout. A small target is attached to the armature of the cutout, and the position of the cutout is indicated by this target, which appears through an opening on the front of the case. The complete device is shown in Fig. 287.

### Ampere-hour Meter

The ampere-hour meter is an instrument for measuring the quantity of electricity passing through an electrical circuit in a certain time. It usually consists of a rotating part connected to a system of gearing which operates one or more pointers that move over the dial on the front of the instrument. The construction and operation of the rotating portion is such that the rate at which it revolves varies directly as the current through the instrument. Thus if a current of 10 amp. causes the rotating part to make 1800 revolutions in one hour, then a current of 20 amp. will cause it to make 3600 revolutions in one hour. Now 10 amp. for an hour is 10 amp.-hrs. and 20 amp. for an hour is 20 amp.-hrs., etc. The gears connecting the rotating part and the pointers and markings on the dial should be such that each division on the dial corresponds to a definite number of ampere-hours. In some types of ampere-hour meters there is a difference in the rate at which the rotating portion revolves when the current through the instrument is reversed. This difference in the indication for the two directions of current may be varied, which permits the loss in a storage battery that is

being charged and discharged through the ampere-hour meter to be taken care of. Thus the adjustment on charge may be such that the instrument reads 20 per cent slow and correct on discharge. In such a case the battery input as shown on the dial of the ampere-hour meter would be the same as the battery output. A typical form of ampere-hour meter is shown in Fig. 288.

### Wattmeter

The wattmeter is an instrument for measuring power, and briefly it is a combination of an ammeter and a voltmeter. One coil, or set of terminals, is connected in series in the circuit just as an ammeter is connected, and the other set of terminals is connected across the circuit just as a voltmeter is connected. The operation of the instrument is such that the deflection of the pointer is proportional to the product of the current in one coil and the electrical pressure applied to the terminals of the other coil, which gives the power in watts.

### Watt-hour Meter

The watt-hour meter is an instrument for measuring the total energy passing a given point in an electrical circuit. It consists of a rotating portion whose rate of rotation is proportional to the power in watts. The rotating portion causes one or more pointers to move over one or more dials by a system of gears. This system of gears and the markings on the dials are such that the pointers on the dials give a reading of the energy in watt-hours or kilowatt hours. In the majority of cases the difference in two readings are taken for a period of approximately a month.

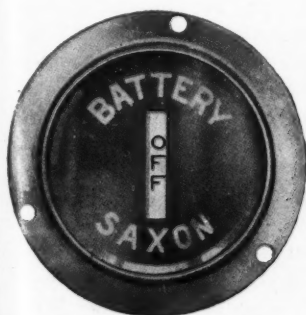


Fig. 286—Battery indicator



Fig. 287—Leece-Neville indicator

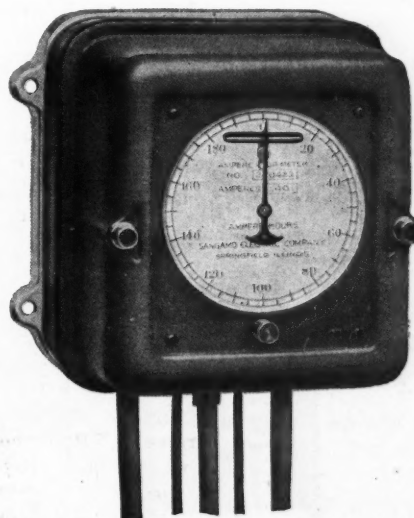


Fig. 288—Ampere-hour meter



# The Readers' Clearing House



## REBUILT ENGINES HARD TO START

### Air Leak in Manifold May Be Contributing Cause

**BISMARCK, N. D.**—Editor *MOTOR AGE*—The engine of my Studebaker E. M. F. 30 speedster has been equipped with new light-weight pistons and rings, racing camshaft and Schebler carburetor, model R. The ignition system is all right, the carburetor new, yet the engine is hard to start. Only two cylinders fire when the engine starts, until more gas is admitted. The engine gets hot too quickly despite fan and water cooling system—there are no leaks. In starting the engine, it is too speedy for driving in the downtown district, and if throttled down, the motor stalls. Can this be adjusted by means of changing the adjustment of the carburetor and magneto to get a lower initial speed?

2—How shall I proceed to adjust the carburetor and magneto?—Carl A. Loven.

1—Hard starting may be caused by any number of things. An air leak in the intake manifold will cause an engine to act as yours does, and it seems likely that this is the trouble. The fact that all the cylinders fire when you give the engine more gas would seem to carry out this statement. Naturally the addition of the gas would take care of the excess amount of air and the engine run all right when speeded up, but cause it to stall when the throttle is closed. Another thing which might be suspected is dirt in the needle valve of the carburetor, or improper adjustment of the latter. Look carefully to the ignition system also, especially the magneto points and plugs.

2—The model R Schebler carburetor is a single jet instrument using two air inlets, one fixed and the other automatic. The automatic valve controls the lift of the single needle valve and in this way any extra air taken in will cause additional gasoline supply to be carried in also. The auxiliary air valve is adjusted by means of the cap placed on top of the valve. The correct position of this cap is determined by first turning it to the right as far as it will go and then turning it back one turn. If this position causes poor firing, the cap should be turned clockwise or counter-

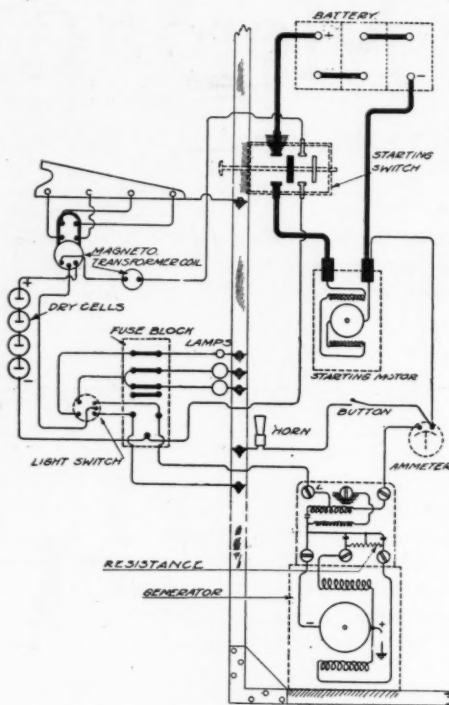


Fig. 2—Gray & Davis system used on 1915 Maxwell, showing method of connecting generator wires

## Communications Received and Inquiries Answered

Carl A. Loven.....Bismarck, N. D.  
R. N. Shinn.....Westhope, N. D.  
Mason A. Frazell.....Franklin, Neb.  
Lee S. Busch.....Indianapolis, Ind.  
Frank Meyers.....Dowagiac, Mich.  
W. S.....Streator, Ill.  
Perce S. Gerber.....Baltic, Ohio  
A. R. Eader.....Beaumont, Tex.  
Frank Linz.....Goldfield, Nev.  
P. C. Bradford.....Blue Mountain, Ark.  
James Baker.....Dewitt, Ill.  
M. D. Ladd.....Imperial, Neb.  
Jack Sacks.....Chicago, Ill.  
G. A. Evans.....Dexter, Mo.  
Newman Bros.....Randolph, Kan.  
Norman Scholton.....Columbus, Pa.  
W. H. Stall.....Minot, N. D.  
G. E. Ruth.....Bucyrus, Ohio  
Clark Smith.....Llano, Tex.

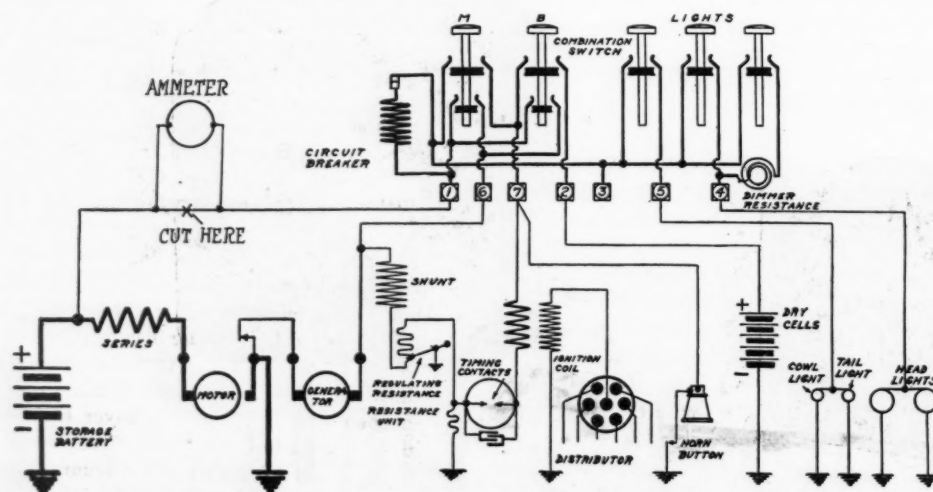


Fig. 1—Wiring diagram showing method of installing ammeter on 1915 Oakland

clockwise until all cylinders fire. The knurled screw in the bottom of the auxiliary air valve chamber should be turned upward, if the engine misfires when quickly accelerated.

The magneto has but one adjustment, which is located in the breaker box on the rear end of the armature shaft. Removal of the breaker box cover discloses two platinum contact points which, after much usage, become pitted so that a bad contact results. These points should be filed flat with a fine file, taking care not to file off any more than is necessary. Then reset the adjusting screw so that the break is just  $\frac{1}{32}$  in.

## Ammeter on 1915 Oakland

**Westhope, N. D.**—Editor *MOTOR AGE*—Publish a diagram for installing an ammeter on a 1915 Oakland car.—R. N. Shinn.

The diagram is shown in Fig. 1.

## Wants to Build Cyclecar

**Franklin, Neb.**—Editor *MOTOR AGE*—Where can I get plans for building an inexpensive cyclecar?—Mason A. Frazell.

The Tribune Engineering Co., Owego, N. Y., can supply these, as well as parts for the car.

## Ammeter on 1914 Buick

**Indianapolis, Ind.**—Editor *MOTOR AGE*—Give directions how to connect an ammeter on a model C-25 Buick, 1914, equipped with Delco lighting, ignition and starting system.—Lee S. Busch.

The ammeter can be connected as shown in Fig. 4.

## Generator Wiring of Maxwell 25

**Dowagiac, Mich.**—Editor *MOTOR AGE*—Publish wiring diagram of the Gray & Davis system used on the 1915 model 25 Maxwell. Also explain how to connect up the wires on the inside of the generator for the above system.—Frank Meyers.

The Gray and Davis system as used on the 1915 Maxwell is shown in Fig. 2, together with manner of connecting the wires of the generator.

## Taxation on E. M. F. 30

**Streator, Ill.**—Editor *MOTOR AGE*—Referring to your issue of June 7 describing the special tax to be levied on automobiles, what will the tax on an E. M. F. 30 whose rating is 25 and 6/10 h.p., now being driven the eighth year. The list price at that time was around \$1,500. Don't they figure on depreciation?—W. S.

The House of Representative's bill to which you refer, has not at this writing become a law, but it is probable that the measures concerning the federal tax on motor cars in owner's hands will be incorporated in the law in substantially the same form as published in *MOTOR AGE*, issue of June 14. This provides a tax of roughly one per cent of the list price to be paid yearly by the owner. This applies to new cars only, for cars over 1 year old there is to be deducted 10 per cent for each year of age. Of course, this clause has not been tested as yet, but it is taken to mean that 10 per cent of the tax which would apply



to a new car would be deducted for each year of age. Your 8-year-old car therefore which listed originally at \$1500 would be figured as follows:

One per cent of \$1500 is \$15, 80 per cent of \$15 is \$12. Deducting \$12 from \$15 is \$3, this year's tax, providing the law were enforced now. If the above assumption for the intent of the law is correct, your car would pay no federal tax after it was 15 years old. The clause upon which this is based may be changed considerably before the bill becomes a law.

#### DIMMERS ON THE 1914 CHEVROLET Resistance Can Be Effectively Put Into Wiring Layout

Baltic, O.—Editor MOTOR AGE—I have a 1914 Baby Grand Chevrolet touring car and want to dispose of the side lights if possible. Advise how I can arrange to have dimmers in headlights. I have a two-wire system with one-bulb headlights. The switch is three-pole; one for headlight, one for sidelights and one for tail light. I want to use the headlight bulbs also for dimmer.—Perce S. Gerber.

To use the headlamps also for dimmers you will need a new switch or an additional switch and a dimmer resistance. A dimmer resistance can be made by winding a spool of iron or German silver wire with insulating layers of asbestos cloth between. The spool should, of course, be wound open, that is, so that adjacent turns do not touch. We should judge that number 16 iron wire would be the proper gage and the length required you could try out before definitely winding it on the spool. This dimmer resistance would then be connected in the light circuit as follows:

Open one of the wires leading to the headlamps at any convenient point, preferably where it leaves the light switch. Get an ordinary electric switch that can be mounted on the dash board and connect the dimmer resistance to the binding screws of this switch. Also run wires from the switch binding screws to the ends of the lamp circuit where it was broken. These connections are shown in the accompanying diagram. The effect is that when the dimmer switch is closed the current will flow to the lamps as usual, whereas when the dimmer switch is opened it will have to flow first through the dimmer resistance and the light in consequence will be cut down in brilliancy.

#### Converting Four-Passenger Stutz

Beaumont, Texas—Editor MOTOR AGE—Publish a sketch of a Stutz four-passenger

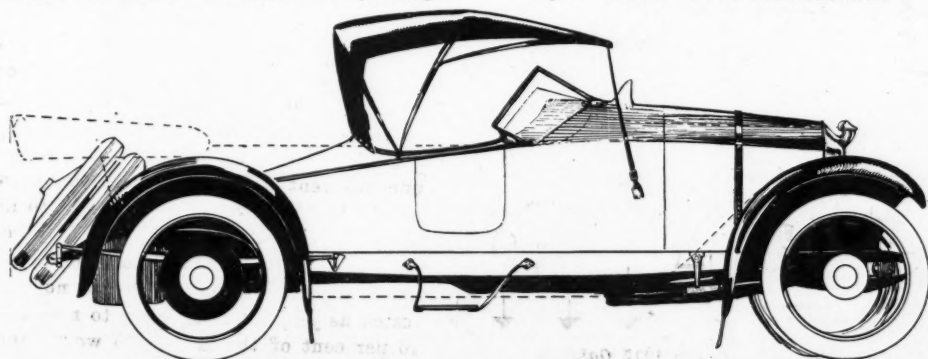


Fig. 3—Stutz four-passenger 1917 model converted into two-passenger speedster

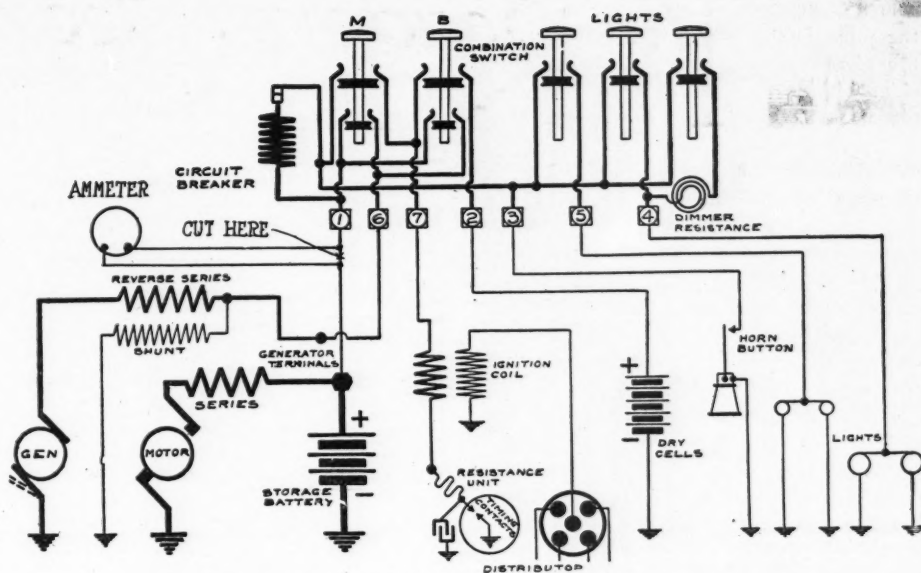


Fig. 5—Wiring diagram of Buick, with ammeter connections

model 1917, converted into a two-passenger speedster—cost to be no item.—A. R. Eader.

A suggestion for a novel conversion of this car into a two-passenger speedster is shown in Fig. 3. Attention is called to the absence of running boards and the general rakish appearance of the car.

#### Reaming Ford Valve Seats

Goldfield, Nev.—Editor MOTOR AGE—I wish to improve my Ford engine. Would the reamer the Ford factory furnishes enlarge the valve seats? How can I tell when it is reamed enough, that is, how can I measure the valve seat?

2—What would be the next larger valve than the Ford to fit the seat?—Frank Linz.

1—Refacing a valve seat on the cylinder block is usually done with a standard size of valve reseating cutter. When reseating valve seats care must be taken not to cut too deep into the seat and thereby lower the valve stem. To tell when the seat has been reamed enough, a little Prussian blue should be applied to it, and the

valve itself rotated back and forth as in grinding. A perfect seat is assured when none of the Prussian blue adheres to the bevel surface of both the valve and seat. After reseating, the valve should be ground in to insure a good tight fit. It is also advisable after an operation of this kind to adjust the clearance between the valve stem and tappets, because the partial cutting away of the valve seat may cause the valve to drop somewhat.

2—1% in.

#### FLANDERS 20 OILING EXPLAINED Constant Level Is Maintained by Vacuum Principle

Blue Mountain, Ark.—Editor MOTOR AGE—Give details and diagram of a Flanders 20, 1911 oiling system.

2—Is there any Ford transmission and rear axle which could be fitted to this car?

3—Would you advise the use of one-third or one-half kerosene in a Buick 6-45? It has the manifold heater. Would this amount of kerosene cause more carbon in the engine?—P. C. Bradford.

The Flanders oiling system as was used on this car is automatic in its action, so long as the reservoir is kept supplied with oil and the filler cap screwed down tight. Its principle of operation is by vacuum and if the cap is not screwed down tight, it will cause an air leak that will release the vacuum and allow the entire amount of oil to flow into the crankcase, flooding the engine.

As shown in the illustration, two supply pipes A and B run from the bottom of the oil tank to the bottom of the crankcase. With the crankcase dry and the oil tank full, the air, being lighter than the oil, will pass through the oil supply pipes to the top of the reservoir. This action relieves the vacuum in the reservoir and allows the oil, it being heavier than the air, to flow into the bottom of the crankcase. When the oil in the crankcase has reached a height that will cover the openings of the supply pipes, obviously the air will be shut off, causing a vacuum in the tank which will hold the remaining body of oil until such time as the engine has con-

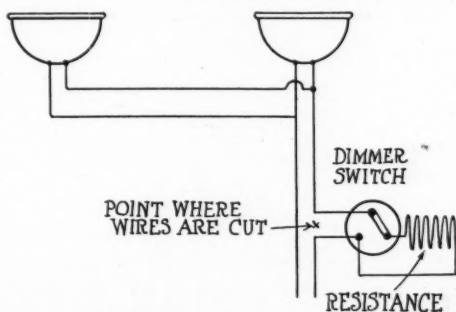


Fig. 4—Dimmer coil on 1914 Chevrolet

sumed a sufficient amount of oil to uncover the pipes again. This, in turn, will allow the air to pass through and release sufficient oil to re-cover the openings in the pipes, thus maintaining a constant level.

2—The Ford rear axle will not fit this car without special fitting and so far as the transmission is concerned, we would not advise trying to install it, inasmuch as the procedure would be quite expensive. In a job of this kind it is hard to give definite information, as so much has to be taken into consideration; such things as shop equipment, amount of money desired to spend, etc.

3—The greatest amount of kerosene that can be used with the average carburetor is about one-third that of the gasoline used. If more kerosene is used with the gasoline, the engine will be harder to start and in all probabilities there will be an increase in carbon deposit.

### VARIABLE CHARGING OF BATTERIES

#### Charging Current Regulated by Unscrewing Lamps

Dewitt, Ill.—Editor MOTOR AGE—I want to get a method to charge a 6-volt or 12-volt storage battery to be able to charge them anywhere from 4 amp. to 15, and so arranged as to charge them separate or together. I want to disconnect the Delco batteries when they are full. Publish wiring diagram.—James Baker.

You do not say what sources of current you have for charging the batteries, but we presume you have a 110-volt direct current service. In that case you can rig up a charging apparatus as shown in Fig. 9. From the mains run two wires to a switchboard on which there is a 20-amp. fuse in each line. Below these fuses there is a 20-amp. single-throw, double-pole knife switch. On the wall you arrange a board carrying a set of sockets for incandescent lamps, about fifteen of them. Then you connect the switch, lamps and battery as shown. In each of the lamp sockets place a 32 cp. carbon filament bulb. You can then regulate the charging current by unscrewing some of the bulbs. Each bulb will consume 1 amp., so that if you want to charge at the rate of 5 amp. you place five bulbs in the lamp rack. If you want to charge two batteries at the same time, one a three-cell and the other a six-cell bat-

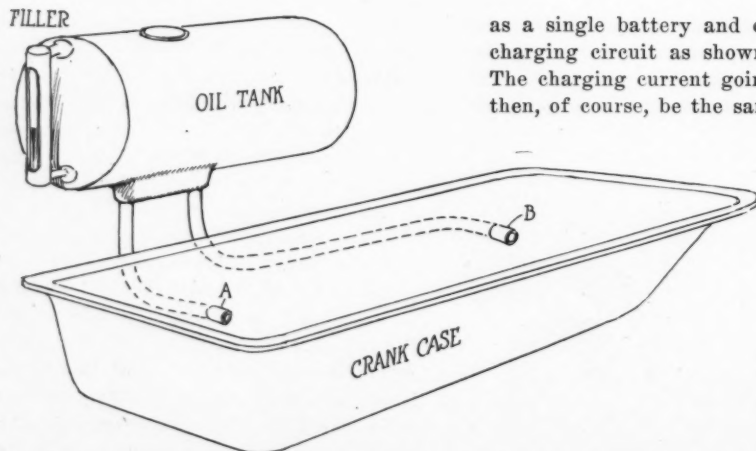


Fig. 6—Diagram of 1911 oiling system used on Flanders 20

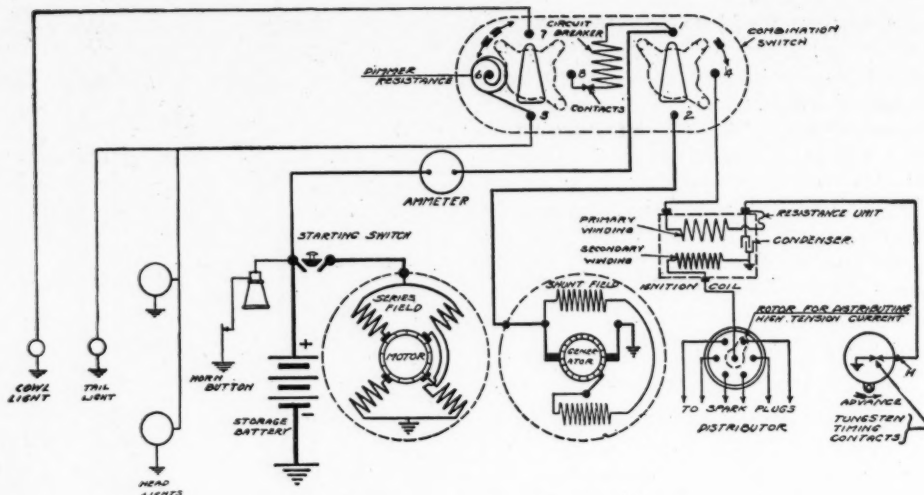


Fig. 7—Wiring diagram of Delco system used on Oakland 32B

tery, you connect the two batteries in series, that is, the positive terminal of one connected by a wire to the negative terminal of the other, and then regard the whole

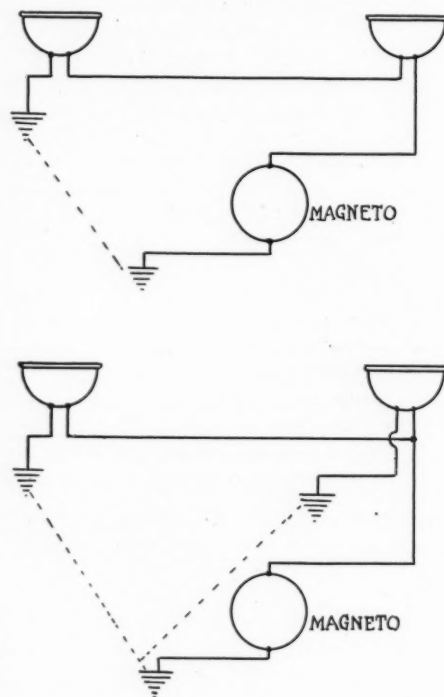


Fig. 8—Ford lamps connected in series above, and in parallel, below

as a single battery and connect it in the charging circuit as shown by the sketch. The charging current going into both will then, of course, be the same. If two such

batteries are connected in series the current passing through each lamp will be slightly smaller than if only one battery is being charged, but the difference will be only about 10 per cent.

### Oakland 32 B Wiring

Manila, Ark.—Editor MOTOR AGE—Publish a wiring diagram of an Oakland model 32B.—M. D. Ladd.

The diagram is shown in Fig. 7.

### Piston Ring Slots in Line

Imperial, Neb.—Editor MOTOR AGE—Why is it that the piston rings on my Chalmers work around so that the opening of the rings are all together, which reduces the compressions, and lets the gas down into the crankcase. How are the rings on other cars fixed to prevent this?—J. V. Forsyth.

It is not uncommon to find a set of piston rings which possess a peculiar weakness for working around in the grooves until the slots are in line. Just why the rings should move round at all is rather a puzzle. Some authorities state that improperly fitting rings, or a piston that does not fit the cylinder correctly will tend to work the ring slots in line. Another theory is that when an explosion occurs in the combustion chamber of the cylinder, it communicates a very minute rotative movement to the ring, a slight escape occurs to the second ring and so on, the path of escape having a tendency to shorten itself. This path of escape would eventually result in all of the slots being in line.

A remedy for this would be to fit rings with a stepped joint which prevents leakage of pressure at the joint. A common way of holding the rings in place to pre-

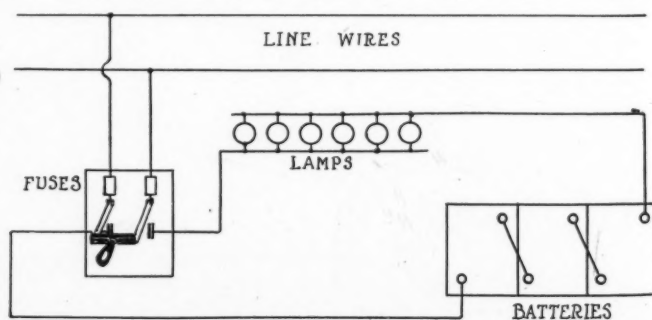


Fig. 9—Diagram of apparatus with which to charge batteries



vent them from turning is to provide a small pin in the groove of the piston which will fit into a hole drilled in the ring. These pins are staggered on the piston, so that the ring openings will occur at different points on the circumference of the piston.

### GROUND NEGATIVE OR POSITIVE?

#### Methods for Testing Strength of Magneto Magnets

Chicago—Editor MOTOR AGE—I have noticed in some electrical systems on motor cars that the negative was used as a ground or return; and on others the positive was used. Which is the correct one to ground or can either be used?

2—What is the best way to test the strength of magnets from a magneto?

3—In fitting piston rings, should a little clearance be left for expansion, and should the top ring have a little more clearance than the lower ones because of getting the most heat?

4—What will cause an engine to misfire when the throttle is opened quickly, while when opened slowly, it will fire regularly?

5—Describe the three-quarter floating axle.

6—In a starting and lighting instruction book it states that when the engine is run without the storage battery the generator should be shorted. Is this meant to short the generator connection to the frame of the car?—Jack Sacks.

1—Either can be grounded, but there seems to be a tendency for grounding the negative terminal.

2—It is often a difficult matter to ascertain when magneto magnets have lost their strength. One method is to turn over the armature of the magneto by hand and when the armature gets to a certain position resistance will be felt. This resistance is due to the breaking of the lines of force by the armature. Since weak magnets produce a weak field, little resistance will be felt. The magnitude of the resistance will not be known unless you try turning over the armature of a similar instrument, the magnets of which are known to be fully charged. The performance of the magneto is sometimes a good test, as to the strength of the magnets. If it gives a weak spark when everything is in good condition, it is quite likely that the magnets are weak.

3—No.

4—This might be caused by several things, such as a low grade of gasoline, a carbureter that is not flexible, inertia of the gas in the intake manifold, etc. An ignition system that is not functioning properly will do the same thing.

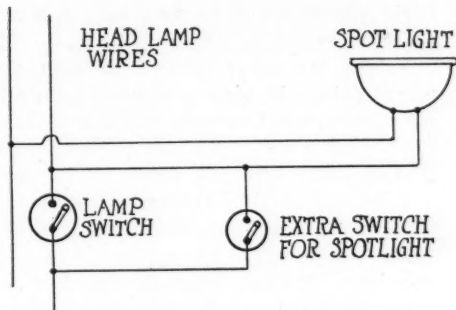


Fig. 11—Method of connecting a spot light with Ford lighting

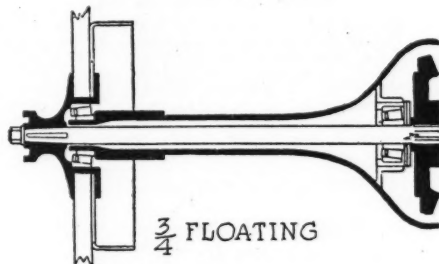


Fig. 12—The hub bearing under the spokes distinguishes this axle

5—The three-quarter floating axle is practically the same as the full-floating type described in the clearing house of MOTOR AGE, issue of June 28. The only difference is in the mounting of the hub bearing, which in the three-quarter floating axle is placed directly under the spokes of the wheel as shown in Fig. 12.

6—Shorting the generator means to connect a piece of bare copper wire from the terminal post of the generator to some part of the generator, such as one of the screws of the name plate, etc.

### WIRING FORD LAMPS IN PARALLEL Likely to Cause Magnets to Become Demagnetized

Randolph, Kan.—Editor MOTOR AGE—We have altered the wiring of lights on our 1917 model Ford, connecting both wires of the right lamp to the lower post of this lamp; then connecting a new wire from the upper post of same lamp to engine, under one of nuts holding manifold. The result was a greatly increased light, a good white light at a slow engine speed, and either lamp burning independent of the other. What is the source of this added light?

2—Does this arrangement injure the engine in any way? It does not seem to affect the running of the car.—Newman Bros.

The two lamps on the Ford are ordinarily connected in series. That is, the same current passes through both, and if the

magneto generates, say, 16 volts, only 8 volts is applied to each lamp. At low engine speeds the voltage will be considerably less than this and the lamps then burn dim. By rearranging the wiring as described, you connect the two lamps in parallel. The full voltage of the lamps is then applied to each lamp and naturally the lamps burn brighter.

We should think that the practice would make the lamp bulbs very short-lived, unless you carefully avoid going at high speed. The increased load on the magneto would also have a tendency to demagnetize the magnets. To produce the same light the magnets must furnish twice as much current as with the original winding connections and the demagnetizing effect is proportional to the current delivered.

### Ford Spindles on Trailer

Dexter, Mo.—Editor MOTOR AGE—How can I attach Ford spindle bodies to a Ford axle or some other form of axle, so that I may use Ford wheels in the construction of a trailer? The problem is to keep them from turning even slightly.—Geo. A. Evans.

Probably the simplest way would be to make two iron braces out of metal  $\frac{1}{2}$  in. thick and  $1\frac{1}{4}$  in. wide, fastening them as shown in Fig. 10. The braces can be twisted properly by heating them red hot and holding one end in a vise while the other is twisted with a large wrench. Holes are then drilled in the axle and braces and the latter held rigid with machine bolts.

### Has Lighting Scheme for Ford

Columbus, Pa.—Editor MOTOR AGE—I have discovered a way to make a better light on my Ford. On the right headlight I put both the original wires together and then ran a ground wire to replace the one taken out. Does this injure the magneto?

2—How should a spotlight be connected so as to have it light with the headlights, or so it could be turned on separately?

3—What is the price of an overhead valve attachment for a Ford?

4—What is the gear ratio in high and low gear on a Ford?—Norman Scholton.

1—This is answered in the reply to Newman Bros., appearing elsewhere in this department.

2—Connect the spotlight wires at the point of origin of the headlight wires beyond the headlight switch. Then put an extra switch in a jumper around the headlight switch.

3—The price of this is \$83.

4—The ratio in high is  $3\frac{7}{40}$  to 1, while in low it is 8 to 1.

### Timing Elmore Distributer

Minot, N. D.—Editor MOTOR AGE—How can I set or time the gas control valve on my Elmore roadster, model 26, which is located in a seat about the middle of the gas distributor?

2—Is the wheel on crankshaft to drive fan put on with a key or set screw?—W. H. Stahl.

1—There are two ways of knowing that the gas distributor is properly timed. If you will notice there is an arrow stamped on the end of the distributor shaft and a set screw that holds the fan pulley on the main engine shaft. When both the arrow and the set screw point in the same line the timing of the distributor is correct. Another way to confirm the timing is to have the set screw pointing straight

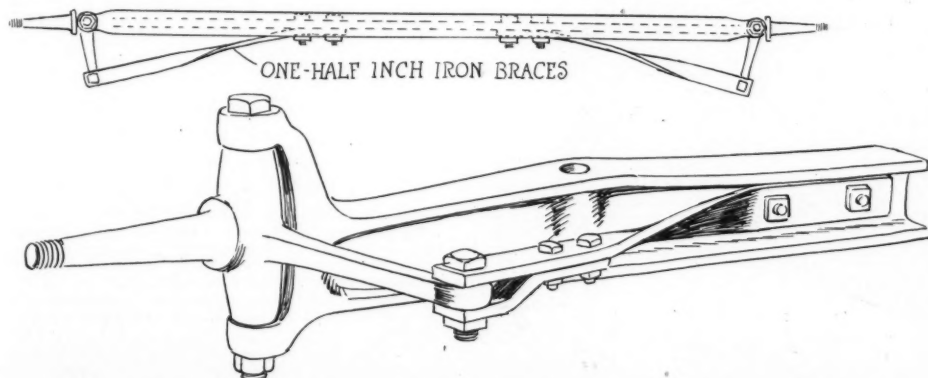


Fig. 10—Iron braces used to hold spindles rigid in using Ford wheels on trailer

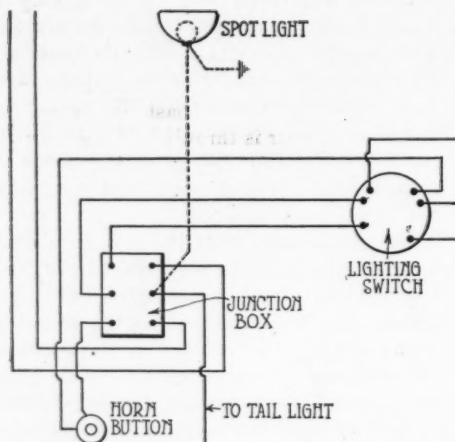


Fig. 13—Method of connecting spotlight on Chandler

down, in which case the second port of the distributor which controls the gas entering the pump chamber of the first cylinder will be entirely open. In making this test you must invariably have the distributor in the advanced position. It is also necessary to remove the first cylinder, the one next to the radiator, in order to observe the port openings.

2—A set screw.

#### Connecting Spotlight on Chandler

Bucyrus, O.—Editor MOTOR AGE—Advise method and show sketch how to cut in a spotlight on a Chalmers 6 equipped with Gray & Davis starting and lighting system, single wire.—G. E. Ruth.

If the light is equipped with a switch, as they usually are, you can run a wire from the tail light terminal on the junction box, as shown by the dotted line in Fig. 13 and grounding the other wire.

#### EXPLAIN DELCO GROUNDED BRUSH Prevents Electrostatic Induction in the Plug Cables

Llano, Tex.—Editor MOTOR AGE—Explain in detail the purpose and principle of the grounded brush in the rotor of the Delco Junior System. It is apparently a safety device to protect the ignition coil.

2—Which is the best way to grind valves? It appears to me that if I ground them with the tension on the springs on them it would cut the face in too much before obtaining a good seat.—Clark Smith.

The object of the grounding brush in the Delco distributor may be explained as follows: When a spark occurs in one of the cylinders and the sparking current impulse passes through the cable connecting with the spark plug in that cylinder, an electrostatic induction effect is set up in the cables leading to all of the other spark plugs, which generally lie very close to the cable in which the current passes. This electrostatic induction may be so strong as to cause sparks to pass at the spark plugs to which the cables are connected. If a spark occurs in the cylinder in which the inlet stroke is taking place, the fresh charge in that cylinder will be ignited and a back-fire through the carburetor will occur. By grounding the cable leading to the spark plug in this cylinder by means of the grounding brush in the distributor the electrostatically induced charge in the

cable will be led off to the ground and can cause no harm.

Valves are never ground in with the valve springs in place. A small spring is sometimes placed directly under the valve head when a valve is to be ground. This automatically lifts the valve off its seat in grinding, which is necessary in order to prevent the formation of circular grooves on the valve seat. The spring, of course, only lifts the valve when the operator releases his pressure on the valve grinding tool.

#### Replacing Wire on Regal

Pittsburgh, Pa.—Editor MOTOR AGE—I have a Regal stripped to a speedster and equipped with a Westinghouse generator. The wiring is badly oil-soaked in places and I wish to replace it. I believe the wiring has been changed from its original to a certain extent, and would like to have correct diagram how it should be wired. The sketch herewith shows location of battery, light, horn, generator, etc.

2—What kind of wire should I use?—W. J. Griese.

1—The diagram is shown in Fig. 14.

2—The best wire for lights has an insulation on the outside consisting of heavy braid, an intermediate layer of treated cloth and an inner covering of rubber. The wire itself consists of fine strands of copper wire and is called flexible, stranded, cable. Number 12 B. & S. gage wire is about right for the lights.

#### Worm Timing Gears in Oakland

Little Rock, Ark.—Editor MOTOR AGE—My 1913 model 42 Oakland has a four-cylinder Northway engine. The timing gears are worn just enough to cause an annoying little knock. Is there any way to take up this play or stop the knock without replacement? I thought of putting some 600 W. in the gear-case to deaden the noise. If this were done, could it work its way into the crankcase, and would it cause any trouble if it did?—Reginald Yates.

There is no way in which this play can be taken up without actually replacing the gears. You can, however, remedy matters considerably by putting in the lubricant you mention. The Chicago agency of

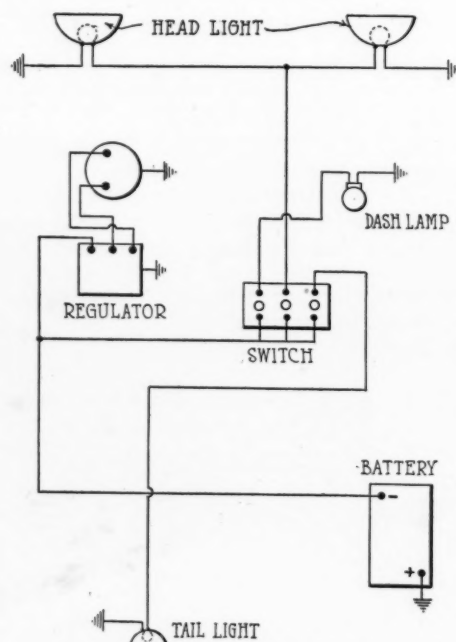


Fig. 14—Arrangement of light wires on Regal

the Oakland states that this is an effective remedy and no harm will result from the use thereof. The oil should be put in about every 500 miles or so.

#### Camphor in Gasoline

Manson, Ia.—Editor MOTOR AGE—Is there any advantage in using moth balls in low grade gasoline? Does their use injure the engine in any way?

2—Is there any way to increase the charging ability of the Auto-Lite generator of my 75 Overland 1916?—H. A. Lowe.

1—The use of camphor in gasoline has been experimented with for some years and the reports are so varying that it is hard to get any data on the subject. In England a few years ago some experimenting was done with camphor, using it in connection with a fuel called benzol. The latter does not vaporize as readily as gasoline. So far as we know there is no special harm done to the engine by using moth balls in the fuel.

2—No.

#### Some Steam Car Inquiries

New Cumberland, W. Va.—Editor MOTOR AGE—Furnish the address of the Stanley Steamer?

2—Has it a transmission or is the engine reversed?

3—What is the gear ratio?

4—What is the price and weight of the Stanley?

5—How is the Doble steam car reversed; also, what is the weight?—Geo. B. Watson.

1—Stanley Motor Carriage Co., Newton, Mass.

2—The car is reversed by reversing the links in the engine in the same manner as done on a steam locomotive.

3—The gear on the engine which meshes directly with the gear on the differential has 40 teeth, the axle gear having 60 teeth. This makes the gear ratio 1.5 to 1.

4—The weight including water, gasoline, etc., is about 3600 lb. The five-passenger car sells for \$2,200 and the seven-passenger for \$2,300. The price of the three-passenger roadster is the same as that for the five-passenger, according to the Chicago sales office.

5—By reversing the engine. The weight is 3500 lb.

#### Battery Probably Sulphated

Goliad, Tex.—Editor MOTOR AGE—The lights on our six-cylinder Overland car brighten up when the motor is speeded, but when running slowly they get so dim as to make it impossible to see the road. The battery and generator seem to be in perfect condition and we have done everything we could to locate the trouble. What is the matter?—Albrecht Auto Co.

It does not seem possible that your battery is in perfect condition, for if it were, the lamps should light up to a normal degree of brightness if the generator were not running at all. The battery is probably sulphated and should be given a long charge at a low rate to freshen it.

#### Data on Miniature Cars

Racine, Wis.—Editor MOTOR AGE—Where can I get information on specifications of Baby Peugeot and Zebre? Am chiefly interested in cylinder dimensions.

2—What is the difference between the European and S. A. E. hp. rating?—T. W. Cushing.

1—The Baby Peugeot was fitted with a monobloc engine having a bore and stroke of 2.17 and 3.54 in. respectively. It was



rated at 7.5 hp. Other details of the car included a Bosch magneto, leather-faced cone clutch, three-speed gearbox, live axle, bevel drive, 20-in. wheels, about 3 in. of road clearance and quarter-elliptic springs.

MOTOR AGE has no specifications of the Zebre.

2—There is no difference. Remember that these ratings are taken at 1000 ft. per minute piston speed.

#### Electric Lights on Saxon

Kennewick, Wash.—Editor MOTOR AGE—I wish to wire my small Saxon roadster for electric lights. I am inclosing a small diagram of the location of the battery, lights, etc. Fill in the lines that the wires must follow in order to give the desired results. I have had trouble in getting the dash and tail light to burn at the same time; when one burns the other is out.—F. F. B.

A method of wiring the lights is shown in Fig. 15. Two switches are fitted, one for the headlights and the other for the dash and tail light. Thus either the head lights can be used alone or the other two. If desired you can install another switch so that the dash and tail light can be worked separately. However, when they are connected as shown, the dash light will act as a check on the other, thus indicating whether or not it is lit.

#### Knocks When Run Short While

Ipswich, S. D.—Editor MOTOR AGE—The engine in my Overland model 83 knocks quite badly when traveling over hilly or muddy roads where it has to pull quite hard on high gear and low speed. Then again, it will be all right. It is a clear, metallic knock and more noticeable when the car has been run only a short while, or with a very lean mixture. What is the trouble?—John Kammers.

A metallic knock which increases as the throttle is opened is in nearly all cases caused by carbon in the engine, which becomes very hot and ignites the gas, causing what is known as pre-ignition. Worn piston rings will act in much the same way, inasmuch as they are allowed to stand still in the cylinders while the piston travels a short distance, corresponding to the wear at the beginning of the power stroke. The knock occasioned by worn rings is not so intense as that resulting from carbon deposits. Other causes may be too lean a mixture, poor valve adjustment or spark lever advanced too far.

#### Shows How to Rebuild Buick

Harrisburg, Ill.—Editor MOTOR AGE—Sometime ago someone was inquiring for instructions to strip a model 10 Buick. This illustration might help him.—Lloyd Stevens.

The suggested change is shown in Fig. 16.

#### Probably Manifold Air Leak

Leland, Ia.—Editor MOTOR AGE—My 1915 Dodge touring car will not run unless the primer or choke adjustment on the dash is pulled about half way up. There do not seem to be any parts worn or broken. How can the trouble be remedied? Will it harm the car any to run it this way?—B. Buren.

The fact that you have to pull out the choke adjustment to keep the engine running would seem to indicate that there was

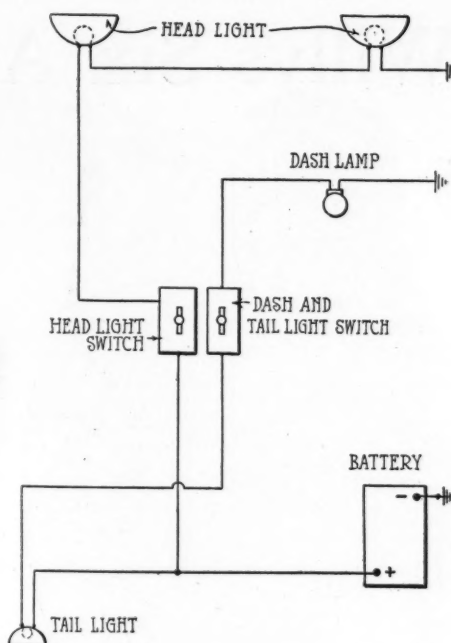


Fig. 15—Layout for wiring on Saxon

an air leak somewhere in the engine, diluting the mixture to such an extent that it is necessary to compensate for it by means of the primer or choke adjustment. Try running the engine with the primer in the normal position and squirt a little gasoline around the intake manifold connections. If the engine speeds up, it proves there is a leak present. There is no special harm in running an engine in this manner, but it is not working under ideal conditions.

#### HIS OVERLAND MISFIRES ON HIGH May Be Due to Dirt in Carbureter or Faulty Ignition

Lakota, Ia.—Editor MOTOR AGE—My model 83 Overland misfires on high, but will run fine on first and second. I have had the carburetor adjusted and it will run all right for a while but as soon as it stands overnight it acts the same way. Could it be the spark plugs? The car will not throttle down on high at all without missing. What is the remedy?—W. G. Black.

Your engine probably misfires because there is dirt or some other obstruction under the needle valve of the carburetor. When you run the car in first and second, the engine turns faster than when it is

propelling the car on high gear, the increased speed of the engine causing greater suction in the cylinders which may suffice to lift the foreign matter enough to let a proper amount of fuel past the nozzle. Then when the car is thrown into high gear and the engine turns less rapidly, the foreign matter may again lodge in the needle valve opening, causing the engine to miss on account of not getting sufficient fuel. Unscrew the needle valve completely and see if there is any foreign matter on it and also take off the gasoline pipe union to see if the gasoline from the tank is flowing to the carburetor at the proper rate. You may be feeding too rich a mixture, which has a tendency to choke the engine. Also see that the points on the magneto are not pitted and that they are the proper distance apart.

#### Car Jerks on High Gear

Sparland, Ill.—Editor MOTOR AGE—My 1917 model C Moline-Knight has been run only 200 miles and the motor is not pulling well on high gear. One day I used the car for 12 miles and it seemed O. K.; the next day it would not pull at all, although the weather was the same. The car gives that jerking motion when the shift is made to third speed and continues that way until a speed of about 15 m.p.h. is reached. When running in low it seems to run smoothly enough when a certain speed is reached and the road is level, but when it comes to a little hill it slows right down and knocks very perceptibly whether the spark is advanced or retarded. The plugs are clean; the sediment has been drained from the carburetor and adjusted as always, but to no avail; the battery is in good shape. What is the trouble?—C. H. Bussell.

Trouble such as you are experiencing may be caused by several things, but usually it can be traced to the carburetor or ignition. We do not mean by this that the carburetor is at fault in its design, etc., but the chances are that dirt or some other form of obstruction has gotten under the needle valve. A partial stoppage of the gasoline to the engine will make the latter behave in the manner you mention. Also look to the magneto points and see that they do not stick. Try varying the mixture; it may be too lean or too rich. Your engine may not have proper compression, which will make it sluggish on hills or when it is pulling hard. Look to the plugs and see that they do not leak. It is also well to check up on the valve action and see that this is right.

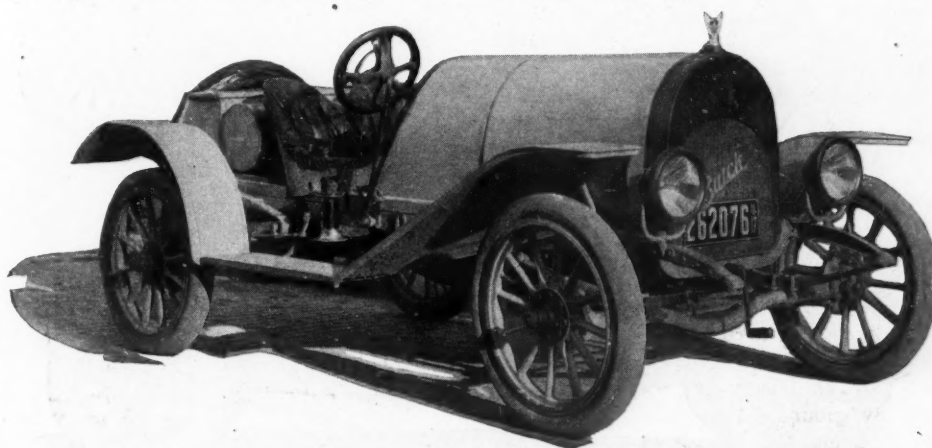


Fig. 16—What one reader of Motor Age did in converting an old model 10 Buick into speedster

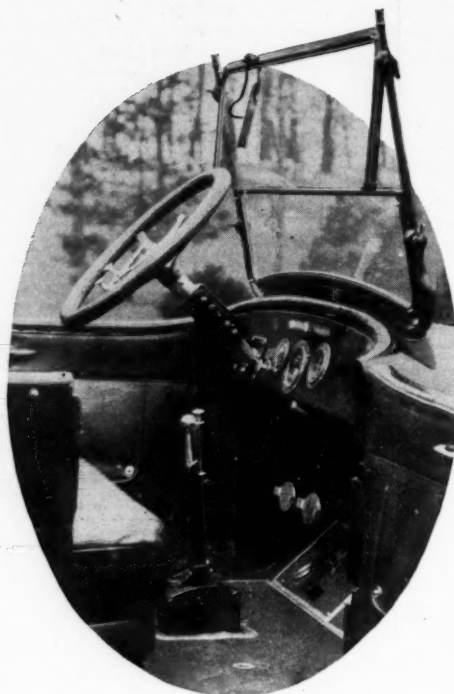
# New 1918 Willys Six Announced

**Continental Engine  
with Con-  
necticut Ignition**

BY a practical combination of the leading characteristics of the six-cylinders cars known as models 85 and 88, the Willys-Overland Co., Toledo, Ohio, has thus condensed its line somewhat. The net result of this combination is a car to be designated as model 89. The powerplant of the new car is the same as that used in the model 88. It consists of a 45 hp. Continental engine having a bore and stroke of  $3\frac{1}{2}$  by  $5\frac{1}{4}$  in. respectively. The company compromised on the wheelbase and chose 120 in. In the two older models this was 116 and 125 in.

Bearing in mind that the new car is a combination of the elements contained in its predecessors, practically everything associated with previous Willy's practice is carried out in some form or other on the new car. The cone clutch has been retained; the gearset is in unit with the rear axle; a three-quarter floating axle is fitted and torque tube method of taking the torsional stresses. The tires on the model 89 are 33 by  $4\frac{1}{2}$  in., which is larger than those used on the smaller six last year and smaller than those used on the larger six.

The purchaser has the choice of three bodies for this particular model, one a seven-passenger touring, a four-passenger Cloverleaf type at \$1,295 and a six-passenger sedan, the price of which has not as yet been announced. The bodies have the



Instrument board of the new Willys six

same characteristics as the previous Overland models; the touring car having a double cowl and leather pads on the doors. Two disappearing seats in the tonneau and the doors are provided with front hinges of the disappearing type. All of the upholstery is carried out in long grain Duratex. Large pockets are fitted to all of the doors and the tool box is placed under the front seat. The Club four-passenger body is streamline in design and equipped with a single cowl. Another thing to appeal to

**Bodies in Four, Five  
and  
Seven Passenger**

the tourist is the fact that the front seats are separate and can be adjusted in both a forward and backward direction. On this particular model the tool box is carried under the back seat. All three types of bodies are fitted with crowned fenders made of heavy metal.

Olive green has been chosen as a standard finish for model 89, with light green wheels. The upholstery is also in dark green, while the fittings are nickel and polished aluminum. The fenders and trimmings are finished in black enamel. The control is similar with that of the former Overland cars, in that the electric buttons are arranged on the steering column, while the instruments are grouped on the cowl board to meet a projected instrument board.

In regard to the engine, this is the standard form of Continental, using six cylinders which are cast in block, with the valves on the right side. The engine is of the L-head type and fitted with a Tillotson carbureter which receives the gasoline from a vacuum tank. Ignition is by a single battery system, with a Connecticut distributor operating in conjunction with an 80 amp. hr. storage battery. The latter can be had in either a Willard U. S. L., or Pres-O-Lite make. The starting system is the Auto-Lite. It is wired for a 6-volt, two-wire system and the starting motor engages the rim of the flywheel through a Bendix-drive. From the engine the drive is taken through an internal cone clutch and thence to a three-speed selective gear system placed on the rear axle. Spiral gears are used in the rear axle drive to the three-quarter floating axle. The gear ratio on high is 4 to 1.

In addition to the conventional equipment of tools, jack, etc., the new model 89 is provided with a Stewart-Warner speedometer, Stanweld demountable rims and a Kellogg power tire pump.

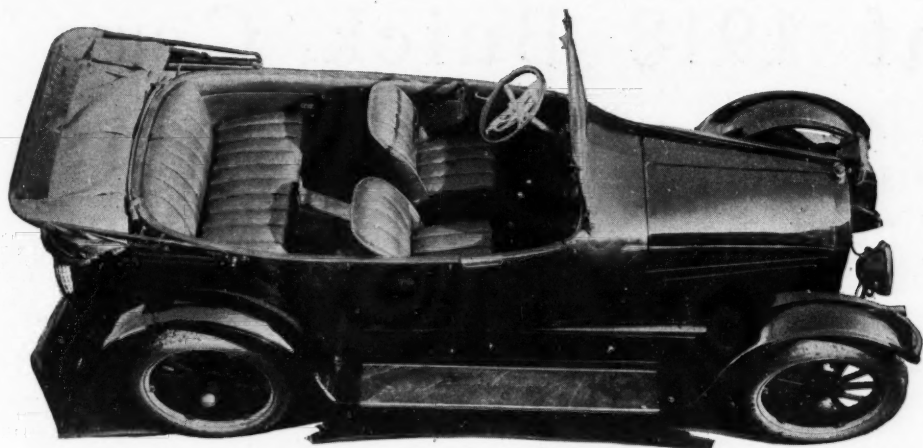
## BAY STATE CARS INCREASE

Boston, Mass., July 7—According to the figures just published by the Massachusetts Highway Commission, there has been an average of 1008 more motor vehicles registered each month since January 1, or a total of 6042 vehicles more than were listed for the entire year of 1916. In other words while there were 136,809 machines registered for all 1916 in Massachusetts there were listed up to July 1, 142,851. Compared with the figures of the first six months in 1916 with the same period this year it shows a gain of more than 37,000.



New six cylinder model of the Willys-Overland and below, the six-cylinder club roadster





Top view of the Willy's club roadster, showing the adjustable front seats

This is very good evidence of motor prosperity in Massachusetts. But there are other figures to back it up. There were 298 more dealers added to the list for 1917 so far than all last year. It shows that there is no dearth of men who are ready to enter the motor industry and place their money in agencies and garages. This gives a total so far of 2275, while all last year there were only 1977 listed. The state has received \$1,607,796.03 so far, or nearly \$47,000 more than was paid in for all last year. The fees this year should reach some \$2,000,000 and the registrations soon will go above the 150,000 mark, for there has been a big rush since the warm weather started.

#### DEALERS IN SALES CAMPAIGN

Milwaukee, Wis., July 7—Following closely upon the heels of the Summer Salon conducted by the Milwaukee Automobile Dealers' Association on June 28, 29 and 30, another sales-boosting event was undertaken to-day by a number of well known dealers of Milwaukee on their own account. The event is called "Buy Your Car Now" week, and the dates are July 7 to 14 inclusive. It was announced this morning by eleven of the most prominent distributors of Milwaukee, as follows:

George W. Browne, Overland; Buick Motor Co.; Moon Motor Car Co. of Wisconsin; the Kissel Kar Co.; R. D. Rockstead, Lexington and Allen; Achen Motor Co., Chandler; Adams-Hopkins Auto Sales Co., McFarlan Six and Stephens Six; Jonas Automobile Co., Cadillac; Mitchell Automobile Co., Mitchell; Milwaukee Auto Sales Co., Briscoe; Osmond Motor Car Co., Chalmers.

#### ADDITIONAL CAPITAL FOR SAXON

Detroit, July 7—A committee of banks and large supply houses, with which the Saxon Motor Car Co. has been dealing, will undertake to furnish additional capital so that the Saxon company need not be restricted for lack of ample cash resources. An advisory committee has been appointed consisting of the following: W. C. Rands, chairman, president Motor Products Corp.,

Detroit; A. H. Zimmerman, treasurer of the Continental Motors Corp., Detroit; C. W. Dickerson, treasurer Timken-Detroit Axle Co., Detroit; Ralph Van Vechten, vice-president Continental and Commercial National Bank, Chicago; William J. Gray, vice-president First and Old Detroit National Bank, Detroit; Charles R. Talbot, vice-president National Bank of Commerce, Detroit, secretary of advisory committee.

#### MYERS HEADS CHASSIS COMMITTEE

Detroit, July 7—Cornelius T. Meyers, consulting engineer, has been appointed chairman of the chassis builders' committee, in Washington, for standardization of the Class A army motor trucks. Mr. Myers is working upon a design to be submitted to a conference of United States army officers and motor truck builders this week.

#### WAR TAX NOW FIXED

Washington, D. C., July 9—The Senate committee has finally written the war tax revenue bill which is now before the Senate for action, the bill containing an excess profits levy which is expected to bring in \$730,000,000 under a graduated levy

service. The new bill makes no change in the form of tax on motor cars, trucks, etc., decided upon and published three weeks ago. The bill also includes an increase of one-fourth of a cent a pound upon second-class postage, and a tax of 5 per cent upon all advertising with an exemption up to and including \$4,000.

#### OZARK TRAIL CONVENTION HELD

St. Louis, Mo., July 9—St. Louisans who have been aiding in the work of promoting the Ozark Trails have received word from Amarillo, Tex., that the recent convention there was a great success. More than 12,000 visitors registered during the sessions and more than 5,000 visitors who arrived in motor cars were assigned quarters in the tent city. Col. W. H. Harvey, well remembered as "Coin" Harvey of the first Bryan campaign, who has been chief promoter of the Ozark Trails, presided.

The chief work of the convention was the decision as to the various section routes. This was decided chiefly on the recommendation of M. C. Wells of Washington who, following the passage of a resolution by Congress, has been assigned to grade the routes after traveling over them in a car, as available for military purposes. They were graded by the usual system of points for distance, drainage, width, grades, concrete culverts, curve turns, above high water, hard surface, enterprise and co-operation.

The decisions were:

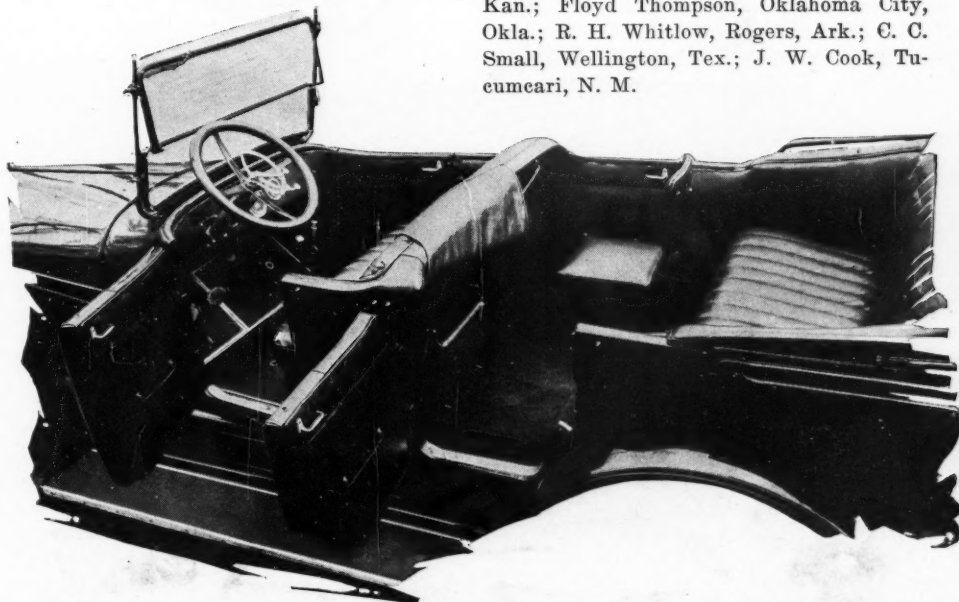
From St. Louis to Springfield, Mo., the Northern route.

From Springfield, Mo., to Joplin, the Mount Vernon route.

From Joplin to Tulsa, Okla., the Nowata route.

From Tulsa to Oklahoma City, the Central route.

W. H. Harvey was re-elected president. The vice-presidents are: D. M. Lightfoot, Springfield, Mo.; Harry P. Scott, Chanute, Kan.; Floyd Thompson, Oklahoma City, Okla.; R. H. Whitlow, Rogers, Ark.; C. C. Small, Wellington, Tex.; J. W. Cook, Tucumcari, N. M.



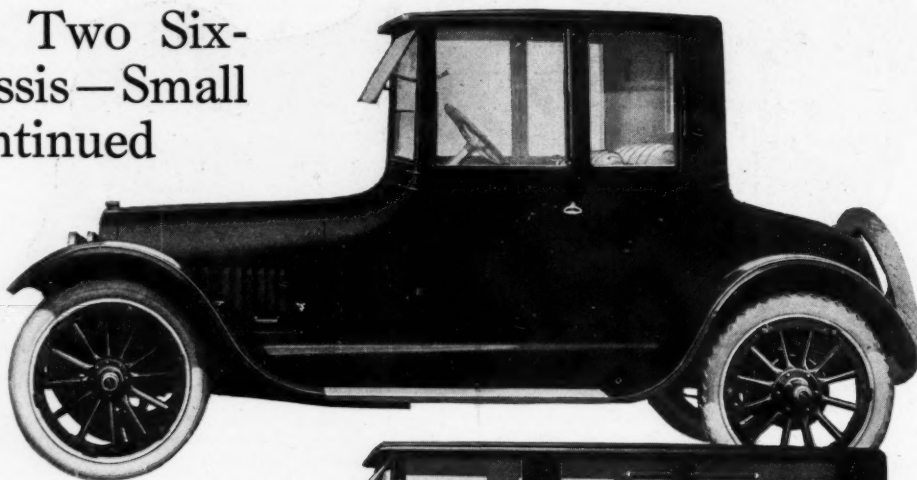
Seating arrangement of the new Willy's six touring car, showing the double cowl effect and disappearing extra seats

# Features of 1918 Buick Cars

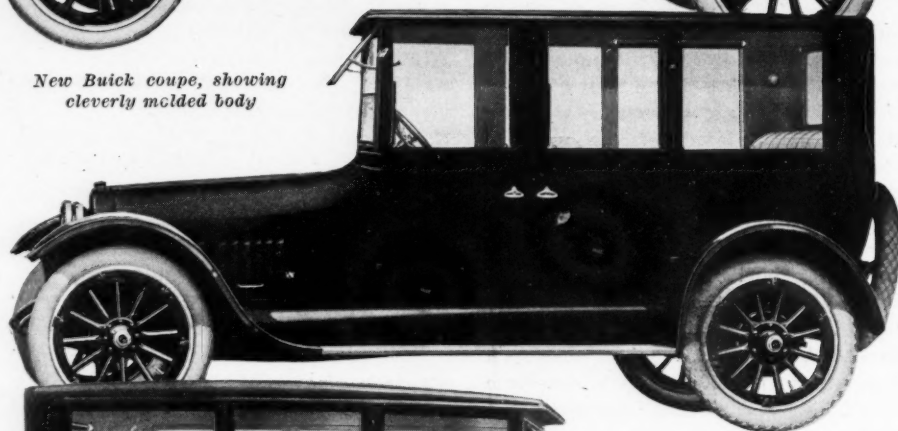
## Line Includes Two Six-Cylinder Chassis—Small Six Discontinued

THREE standard models of chassis comprises the Buick line for 1918. Two of these are sixes, and the only material difference between them is in the wheelbase, which is 124 in. in the larger and 118 in. in the smaller. The engines are identical in each. On the four-cylinder chassis the smaller types of bodies are mounted. The light delivery wagon uses the small chassis also. The engine formerly known as the Buick Little Six has been discontinued and in its place the standard six-cylinder will be used. Production has been greatly simplified, inasmuch as instead of making three engines for the complete line of cars, it is now only necessary to make two, the six and the four. The line has also been improved by the addition of the light delivery wagon.

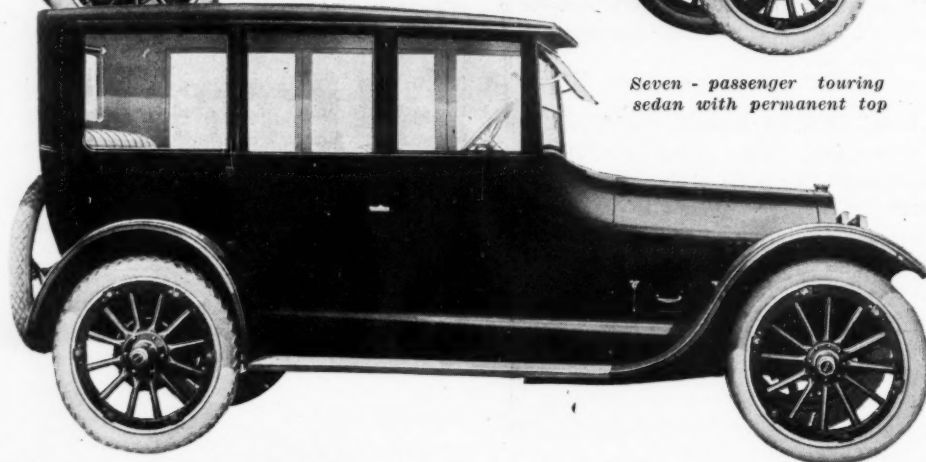
The four-cylinder chassis, while in most respects the same as that of last year, known as the D-4, has been altered somewhat in details. For instance, the gear type oil circulating pump has been adopted to replace the plunger type pump. The new pump is driven from off the camshaft by a horizontal shaft. An oil sight-feed has been installed on the instrument board. An ammeter is also installed. New valve lifts, with dust guards, are used and an improved accelerator pedal of the rocking type replaces the plunger type pedal previously used. Also in the drive are found new kinds of universal joints, in which the steel pins bear directly against the steel bushings. No separate bushings are used



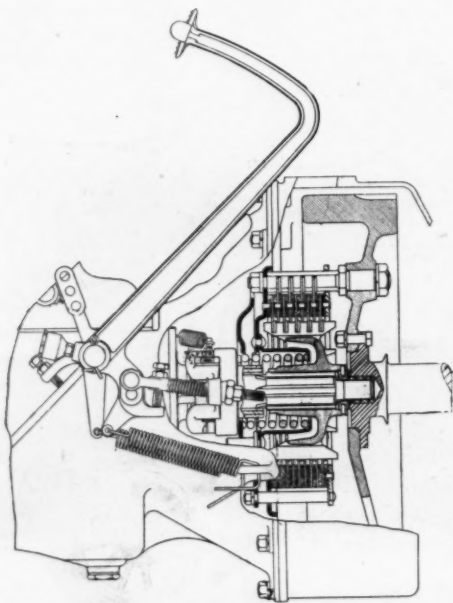
*New Buick coupe, showing cleverly molded body*



*Seven - passenger touring sedan with permanent top*



*The five-passenger Springfield type sedan, which uses the smaller six-cylinder chassis*



*Buick disk clutch, which replaces clutch on six-cylinder models*

in the joints. The control lever has been lengthened, making the car more convenient from the driver's standpoint. The rear springs of this model have also been lengthened 4 in. The foregoing changes represent the chief mechanical changes of the four and so far as the appearance and riding qualities of the car are concerned, the following improvements manifest themselves.

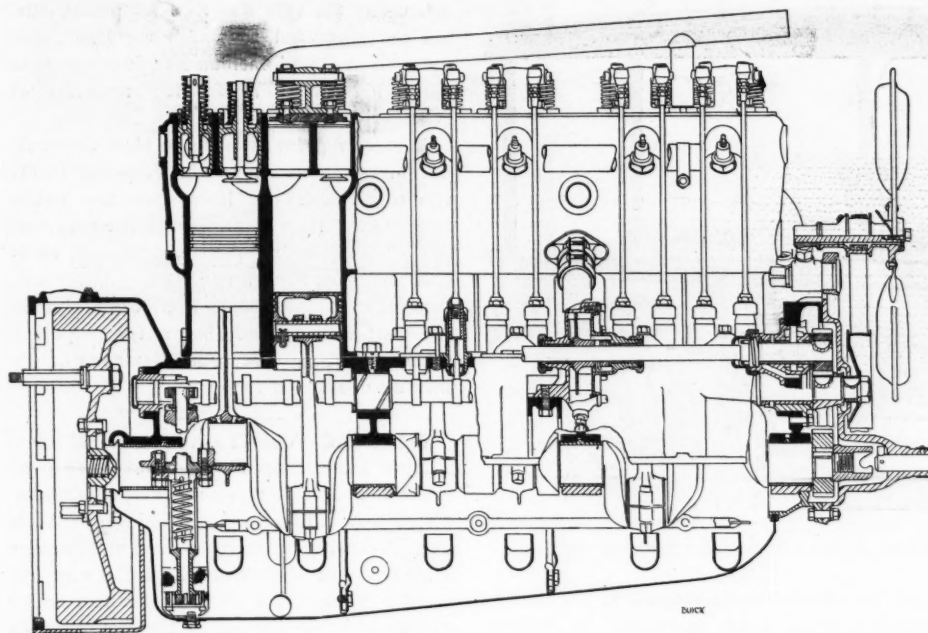
For one thing, the instrument board has been narrowed and trim rails added all around the body. The seats are low and have higher backs than heretofore, with plaited cushions and backs. Linoleum is used on the floor instead of rubber and the top is of mohair in place of the fabric formerly used. The side curtains are improved, with larger lights. Other new fea-

tures include sloping windshield, crowned fenders, new type of demountable rims and better body finish in general.

A few changes of a minor nature have been made in the larger six, principally in the body and color scheme, but as far as the engineering features of the chassis are concerned, the latter remain the same. It is the engine which has brought out particularly for this seven-passenger car which has now been adopted as the standard Buick six for both six-cylinder chassis.

The primary improvement in the six which replaces the former Little Six, is, of course, in the larger engine, but in addition, there are several other changes tending to make the car more comfortable. The wheelbase has been lengthened to from 115 to 118 in., and in place of the cone





Sectional view through six-cylinder Buick engine, which is now standard for all Buick six-cylinder cars

clutch, a dry-plate multiple disk clutch is fitted. Another new feature is the fitting of an inclosed type of universal with spherical ball drive. Some of the other changes which will be noted on the new models which are just entering into production are as follows:

Timken roller bearings in the front wheels in place of ball bearings; grip type of brake lever in place of the button type; ball-bearing distributor on the Delco generator; raised radiator and hood; deeper frames; flush body panels and new Stewart speedometer. In order to improve the service work on the cars a hole has been cut in the side aprons to facilitate removal of the spring bolts. A hole has also been cut in the drip pan for draining the crankcase.

Inspection of the six-cylinder engine reveals the familiar Buick overhead valve action, the valves of which are inclosed in cages. The larger six is characterized by the fact that the inlet valves are larger than the exhaust, making it necessary to stagger them on the cylinder head. The bore and stroke of the engine is  $3\frac{3}{8}$  and  $4\frac{1}{2}$  in. respectively, the cylinders being cast in block. The pistons are fitted with three rings and the connecting rods are of the conventional I-beam construction. The crankshaft has four main bearings, the same being true of the camshaft. The valve drive is through external push rods to the overhead rockers. The valve dimensions are  $1\frac{1}{8}$  in. across the throat for the inlet and  $1\frac{1}{4}$  in. for the exhaust. The valve lift is  $\frac{3}{8}$  in.

A constant level circulating splash system of oiling is used, operated by a gear pump driven by spiral gears from the camshaft. The pump is completely inclosed in the crankcase. Oil is delivered directly to the main bearings and other points by splash. The water for cooling is circulated by a pump through a cellular type radiator.

The fan, made of pressed steel, is driven by an adjustable belt from the camshaft.

The carburetor is of the automatic float-feed type supplied by a vacuum system from the gasoline tank placed in the rear of the car. There is a carburetor air regulator on the instrument board. Ignition, lighting and starting is accomplished by a single-unit Delco system, built as an integral part of the engine, in conjunction with a three-cell, 80 amp. Exide battery. The Delco system operates at 6 volts. The reduction between the starting motor and the engine is 21.5 to 1.

From the engine the drive is taken through a disk clutch to a three-speed selective sliding gearset. The rear axle is full-floating, having a 4 to 1 gear ratio on

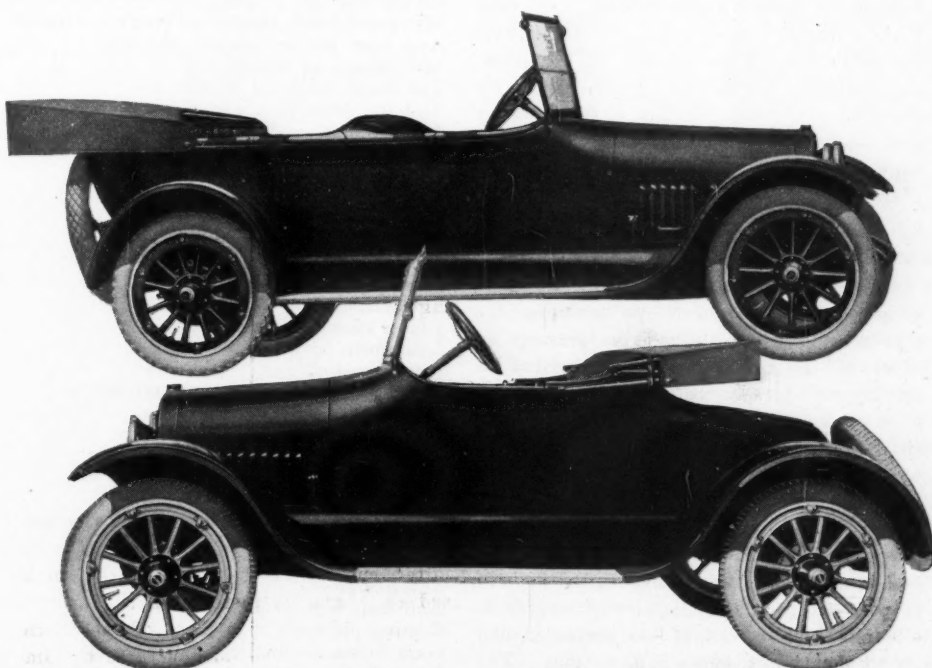
the 118 in. car and a 4.61 to 1 on the 124 in. The drive shaft is  $1\frac{3}{8}$  in. in diameter on the lighter car and  $1\frac{1}{2}$  in. on the larger. Timken bearings are used in the differential, with ball thrust for the drive pinion and ring gear. The road clearance is  $10\frac{1}{2}$  in. and the larger car is equipped with rebound snubbers on the front.

On the 124 in. chassis the tire size is 34 by  $4\frac{1}{2}$  in. while on the 118 in. it is 34 by 4 in. The front springs are 36 in. long and 2 in. wide, with nine leaves on the smaller six and thirteen on the larger. Cantilever springs are used in the rear, these being 46 in. long and  $2\frac{1}{2}$  in. wide, having from eight to eleven leaves in accordance with the body.

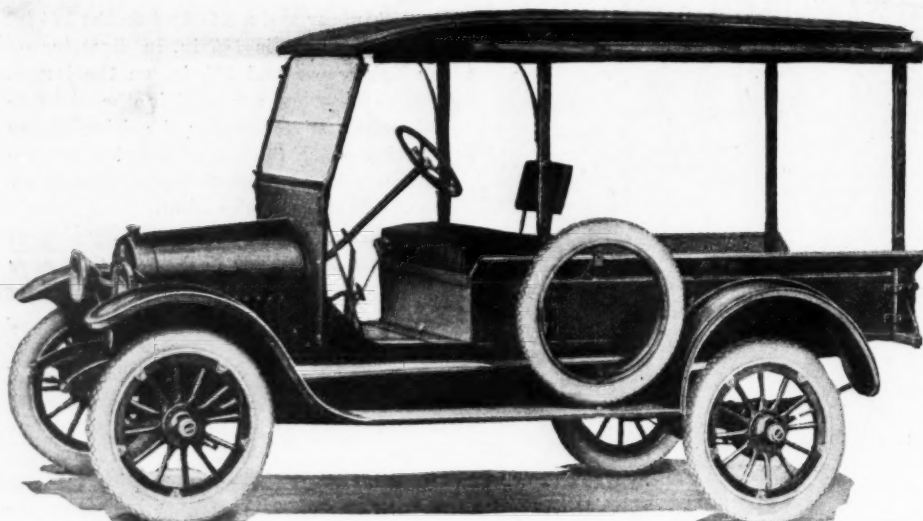
Outside of the changes previously mentioned, the four-cylinder car remains the same as the 1917 model. The four is fitted with an overhead-valve block engine having a bore of  $3\frac{3}{8}$  in. and stroke of  $4\frac{1}{4}$  in. The cylinder head is removable. Splash system of lubrication is used; Delco lighting, starting and ignition; cone-clutch and three-quarter floating rear axle. The tires on this model are 31 by 4 in.

The same chassis is used for the delivery wagon, the body of which is in the form of the open flare type, with canopy top and side curtains. The inside of the body of the delivery car is  $42\frac{1}{2}$  in. by 70 in., including the space under the rear of the driver's seat.

The body line for the 1918 Buicks has been broadened and made more complete. The seven-passenger car has a double cowl and disappearing extra seats. The seven-passenger sedan, a product of the Fisher Body Co., Detroit, gives a touring combination with permanent top and disappearing glass side panels. The seven-passenger touring car sells for \$1,495, and the sedan for \$2,175. On the smaller six-cylinder



Buick seven-passenger touring car, showing double cowl and, below, the four-cylinder roadster which sells for \$795



*Buick delivery wagon, which uses the same chassis as the four-cylinder pleasure cars*

der chassis there are four bodies to be had; a three-passenger roadster at \$1,265, a five-passenger touring at \$1,265, a five-passenger coupe selling for \$1,695 and a five-passenger Springfield type touring sedan for \$1,795. On the four-cylinder there are two styles of passenger bodies and the delivery body. Both of the former sell for \$795, one being a two-passenger roadster and the other a five-passenger touring. The price of the delivery wagon is \$790.

#### DRIVE AWAY CARS HELD

St. Louis, Mo., July 9—Monday and Tuesday, before the Fourth, dealers drove 153 cars away from here. Soon after they departed reports of arrests in nearby towns came pouring in. Local officers had held the drivers for lack of a license. A few days ago the state officers sent out letters warning county and town officials to be on the alert for motor cars not properly tagged. In St. Louis it long has been the custom to pass drivers taking new cars from a dealer's salesrooms, but the suburban officers could not see it. W. C. Anderson obtained the release of all drivers by showing the local officials that it would cost more than \$25,000 to obtain license tags for all cars driven from the assembly plant.

#### BONUS FOR STEADY WORKERS

La Crosse, Wis., July 9—That the proposed production of 1000 tractors for this year may not suffer from scarcity of labor, the La Crosse Tractor Co. called its employees together July 3 and offered to give each employee now working, or who shall hereafter be employed, and who shall work steadily through to November 1, a bonus amounting to 10 per cent of his wages earned during that period. No employee shall be discharged except for cause and if any employee is conscripted he will be paid pro rata, that is, he will receive as a bonus 10 per cent of his wages earned up to the time he goes into service. The plan is said to have been made largely to encourage steady and efficient work

and to offset the inducements of higher salaries being made elsewhere to attract the company's employees. The company has openings for a number of machine and bench hands and tool makers.

#### BETTER COPS; FEWER LAWS

St. Louis, Mo., July 9—After a long series of conferences of officials and committees of clubs interested in motor car law enforcement, a recommendation has been made that alert officers are a greater need than more laws. The conference declared that most of the offenses, aside from parking law violations, were committed beyond the jurisdiction of the traffic officers.

#### THE MOTOR TRUCK

I am the motor truck,  
Conceived in the interests  
Of progress.  
I come forth a perfect being.  
My task is to render service  
To the children of men.  
My great heart throbs at man's command  
And vast power courses through  
My sinews of steel.  
The bleak winds of winter  
And the dawn of a mid-summer morning  
Are alike to me.  
I know not darkness  
Or light, but labor on  
As untiring at the eternal years.  
I serve the high and the low;  
I bring bread to the children  
Of the wage-earner;  
I am the obedient slave of  
The millionaire.  
I have taken up the burdens  
Laid down by the horse and ox;  
I am speeding them on and on  
Keeping step with the great strides  
Of Science.  
I am also an implement of war;  
I serve alike under the white lights  
Of the great cities, or  
Out on the lonely desert plain.  
In the end when man has finished  
His work on earth  
I garb myself in funeral robes—  
The hearse—  
And bear him to his last  
Resting place.  
I am blind, feelingless, never-tiring;  
I am the servant of mankind;  
I am the motor truck.

—By J. H. Kershner.

A remedy for this was that all police officers be instructed to watch for light, cut-out and speed violations and instructed to make arrests or report tag numbers of offenders.

A strong point was made that the traffic policemen could not be responsible for the enforcement of laws over the entire city. Also it was suggested that motorcycle policemen be put in uniforms, as it was more important to prohibit law violations than unexpectedly to arrest violators. All conferees agreed that a traffic policeman in uniform was the best means of obtaining obedience to laws.

#### N. A. C. C. ADMITS NEW MEMBERS

New York, July 6—The membership of the National Automobile Chamber of Commerce now includes 109 complete vehicle manufacturing companies. The Service Motor Truck Co., Wabash, Ind., was the 109th. Forty-three of the members make commercial cars; some of these also make passenger cars. Members admitted recently are Atterbury Motor Car Co., Buffalo, N. Y.; Dorris Motor Car Co., St. Louis, Mo.; Hal Motor Car Co., Cleveland, Ohio; Jordan Motor Car Co., Cleveland, Ohio; Kleiber & Co., San Francisco, Cal.; Liberty Motor Car Co., Detroit; Moline Plow Co., Moline, Ill.; Simplex Automobile Co., New York.

#### U. S. MOTOR EXPORTS

New York, July 6—Australia imported more than \$6,000,000 worth of motor cars and accessories during 1916. During the last two years the exports have been as follows: Motor chassis, \$1,812,912 in 1915 and \$4,749,104 in 1916; motor car bodies, \$472,994 and \$1,521,141; motorcycles, \$138,393 and \$588,705; and manufactures of rubber, \$832,735 and \$2,939,131.

The imports from the United States into New South Wales were: Motor chassis, \$712,791 in 1915 and \$1,965,695 in 1916; motor car bodies, \$175,374 and \$619,227; motorcycles, \$19,684 and \$160,929, and manufactures of rubber, \$1,217,398 and \$2,012,560.

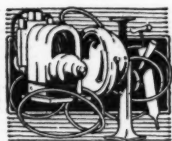
#### WAS TITAN; NOW HINKLEY

Detroit, July 7—The Titan Motors Corp., organization of which was announced in a recent issue of MOTOR AGE, has changed its name to the Hinkley Motors Corp. The change is made because it was found that the name Titan has been previously used. The company will first devote its activities to the manufacture of army truck engines.

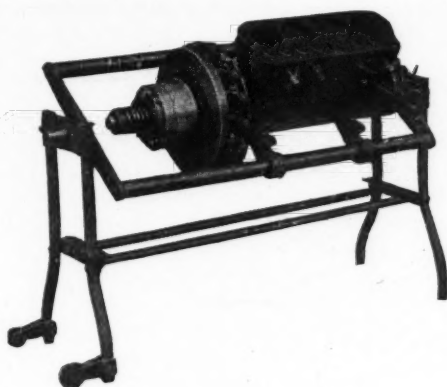
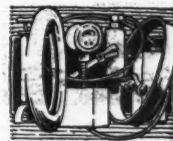
#### NEW MOTOR TRUCK CO.

Fremont, Ohio, July 7—The Taylor Motor Truck Co. with a capital of \$1,000,000 has been incorporated and will take over the Burford Motor Co. here. Stockholders of the company include R. E. Taylor, who was formerly with the Gramm Motor Co., Lima, Ohio; Robert Willoughby, New York City, and E. M. Sheehan, L. A. DeRan and E. H. Weinhart, of Fremont.





# The Accessory Corner



*The Nonpareil revolving motor stand*

## Nonpareil Revolving Motor Stand

THIS stand is designed for quick handling of the Ford engine in the shop. The stand is substantially built of iron and steel and holds the engine at any angle for rapid and convenient work, either crankshaft or valve side up. The engine is always free to turn over, which is a desirable feature when feeling out bearings. The transmission and flywheel can be easily detached when the engine is held on this stand and there is no danger of damaging the valve stems or abrading the magneto windings, it is said. The machine is portable, being mounted on two wheels at one end. The engine is attached by four quick acting clamps. No bolts are used. Nonpareil Mfg. Co., Cochran, Pa.

## Syracuse Ford Lock

The lock is installed on the regular switch and claimed to be absolutely burglar proof, because it can be turned only by the three keys that come with it. Also, even though the plate screws are removed, the plate cannot be taken off without the key. It is further stated that a master key is impossible and additional keys are obtainable from the makers only by lock number. There are no wires to connect when installing it and it is said that the lock can be installed in about 3 min., with the aid of a screw driver only. It is finished in



*Syracuse Ford lock installed on regular switch*

highly polished nickel. Price, \$1.50. Syracuse Universal Mfg. Co., Syracuse, N. Y.

## Clear-O-Scope

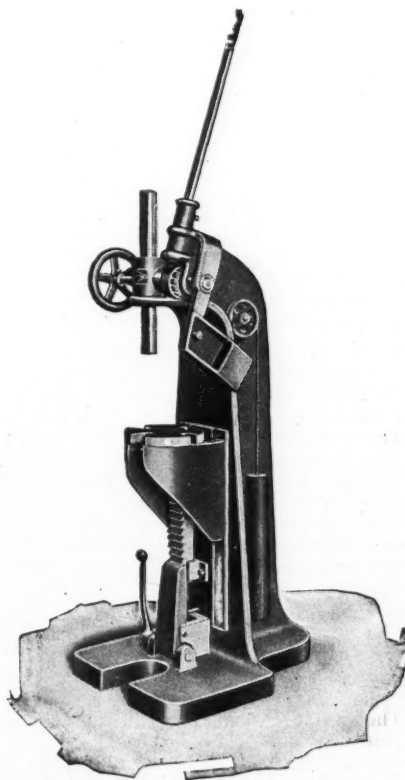
The Clear-O-Scope is a device for keeping the windshield clear in stormy weather. It slips over the top of the shield and can be installed in a few moments on any make of car as there are no adjustments to make and no bolts or screws to be put in. A springy handle holds it snugly in place and that combined with the rubber guards, effectually prevents rattling, it is claimed. The price is \$1. The Clear-O-Scope Co., Chicago.

## Valhalla Moisturizer

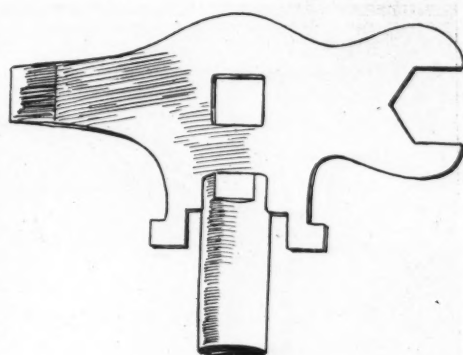
This is a device to be fitted to an engine to take warm moist air or vapor from the radiator and feed it to the cylinders by way of the intake manifold. Gasoline, distillate or any other fuel, is said to carburete more freely with the introduction of moisture into the cylinders. With the Valhalla Moisturizer an engine is said to be capable of 25 per cent more speed, power and mileage. The device is also claimed to be an efficient carbon remover. Price, \$10. Valhalla Products Co., Chicago.

## Fox Arbor Press

Announcement has been made by the Sunderland Machinery & Supply Co., Omaha, Neb., of a new arbor press built to



*Fox arbor press for forcing in bushings, etc.*



*Four-in-One Ford switch key*

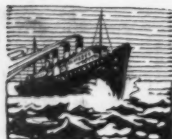
take work up to 19 in. in diameter. The No. 4 press shown is equipped with a special type of table elevating and lowering mechanism. A counter weight on the back of the press carries most of the weight of table and lower rack bar. The frame and table are of cast iron; the rack pinion, pawl and ratchet of alloy steel. The floor space needed for the press is 24 by 33 in. and the height is 60 in. The complete outfit weighs 1100 lbs. The ram or rack has a movement of 17 in., while the leverage is 60 to 1, thus a maximum amount of pressure can be exerted with the least effort on the part of the operator.

## Four-In-One Switch Key

A switch key for Ford cars, designed to make most any adjustment on the Ford spark coils, has been brought out by Everett Ward, 1777 Broadway, New York. It is fitted with a screw driver end for adjusting the vibrator screw. The open end wrench is used for the coil terminal post nuts. The square hole in the center is for the gas tank valve, while the key proper fits the lock on the coil box the same as the Ford key. The key is copper plated and polished and sells for 15 cts.

## Ad-El-Ite Carbon Remover

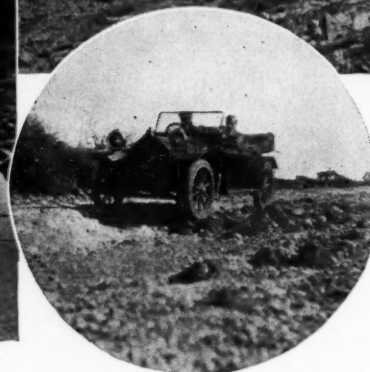
This is a liquid put up in quart, pint and half-pint cans intended to be introduced into the combustion chambers of an engine for the purpose of removing the accumulated carbon deposits. In use a tablespoonful of the fluid is placed in each cylinder through the spark plug hole and the plugs replaced loosely. The engine is allowed to stand for an hour or so, or overnight, whereupon the plugs are removed and the engine turned over several times to force out the surplus gases. Then the plugs are replaced in the usual way and the engine allowed to run. The carbon, it is said, will come out of the exhaust line in the form of fine powder or chunks. The half-pint, pint and quart cans sell for 50 cts., 85 cts., and \$1.50 respectively. Adams & Elting Co., Chicago.



# From the Four Winds



**B. S. A. ROAD CONDITIONS**—Here are pictured general road conditions in British South Africa. The photographs are from H. J. Rogaly, Hupmobile agent in Port Elizabeth



**GASOLINE** Record for May—Consumption of 193,446 bbl. of gasoline in May was a Minnesota record, according to A. M. Opsahl, oil inspector. Last year the May record was 126,884 bbl.

**Iowa Adds 27,176 Cars**—Registrations of new motor cars in Iowa show a total of 27,176 of cars for the first six months of the year. This does not include makes of which less than ten have been registered. Fords lead the list with 16,950, and Buicks are second with 1632. Overlands rank third with 1388.

**Motor Truck Club Changes Membership**—The membership requirements of the Motor Truck Club are changed so trade members and others interested in the welfare and the advancement of motor trucks are eligible for membership along with the actual owners or operators of trucks. Heretofore only owners could hold membership.

**Minnesota Runs Short of Tags**—With 27,000 sets of tags issued since Jan. 1 the Minnesota secretary of state found himself short 2000 on orders and is issuing special certificates to new car owners to protect them against arrest for not displaying number tags. Labor scarcity at the factory is charged with the shortage.

**Motorists Meet at Amarillo**—One of the features of the convention of the Ozark Trails Highway Association held at Amarillo, Tex., recently, was a parade in which more than 3000 cars participated. More than 10,000 delegates and other visitors attended the convention. They represented the contending routes in Missouri, Arkansas, Oklahoma, Kansas, Texas and New Mexico. D. M. Lightfoot, of Springfield, Mo., presided over the sessions of the convention.

**Motorists Help Police Department**—Fifty special traffic policemen in Minneapolis, Minn., are at work checking up violators of various road laws in co-operation with the police department. Members of the Automobile Club and the Civic and Commerce Association are the new cops. They are devoting their time just now to warning against extinguished tail lights, glaring head-

lights, open mufflers and speeding. Letters have been sent to drivers asking them to obey the rules.

**Georgia Road Funds \$128,059**—Secretary of State Phil Cook has turned over to State Treasurer W. J. Speer the apportionment of the Georgia road fund for 1917 from the motor car licenses. The total road fund available this year is \$128,059, as against \$96,000 for 1916.

**St. Louis Has Official Keeper of Thefts**—The Henry Motor Service Co. has been named official keeper of stolen cars in St. Louis. A policeman who finds a stolen car will notify the Henry garage and the car will be taken there and kept until released by an order from the police department. One reason for the "official garage" is to establish evidence by expert testimony as to condition and marks of the stolen cars.

**H. C. of L. Downs Louisville Jitneys**—After July 1 the few remaining jitney buses in Louisville will cease to operate and motor car rides for a nickel in that city will be a thing of the past. The thirty-four members of the Louisville Jitney Bus Co. have agreed to acquiesce in the will of the majority that business be suspended on that date. High cost of gasoline, which has increased from 9 to 24 cents a gallon since the buses started about two years ago, and of tires and accessories are blamed.

**Cleveland Regulates Used Car Trade**—Cleveland, Ohio, has an ordinance which regulates the sale of used cars and parts. It provides that every dealer handling them shall fill out a description blank furnished by the department of public safety, which shall list the name and address of persons from whom they were obtained, the time when it was bought and the make, license and factory number of motor car. These blanks are to be filed with the chief of police each day by

noon, with the complete list of all the property obtained the day preceding. Maximum penalties of \$100 fine and six months' imprisonment are provided.

**Indianapolis Regulates Vehicles at Night**—The common council of Indianapolis has passed an ordinance providing a heavy fine for the driving of a vehicle after sunset if it contains a load that extends over the bed of the vehicle 5 ft. or more without having a red light attached at the end of the protruding load. The Hoosier Motor Club had compiled statistics to show that many accidents have resulted from motorists colliding with objects extending over the beds of vehicles.

**Women Win in St. Louis Run**—Women carried off the honors in the Century Boat Club's annual motor car run through the streets of St. Louis. Mrs. C. C. Crossman, driving a Hudson Super-Six, won the driving honors with a score of 970 out of a possible 1000 points. The prize was a silver cup donated by Governor Frederick O. Gardner. Mrs. J. E. Schertz, also driving a Hudson, won the decoration prize. Observation of traffic laws was a prominent point in the grading of all contestants.

**Washington Requires Trailer License**—Owners of trailers for motor trucks in the state of Washington should have licenses for their trailers, as the new code, which went into effect on June 7 provides that such vehicles must be licensed. The old law required them to be licensed according to capacity, but inasmuch as they usually were hooked on behind passenger cars, few were taxed. The new law requires a license based on the capacity of the truck. The new regulation in regard to headlights is also in force now. The light must not show more than 42 in. above the ground.





# Among the Makers and Dealers



**HELPING THE CANADIAN SOLDIER CONVALESCENCE**—This shows eighteen Cole eights which were used to give an outing to wounded Canadian soldiers convalescing in Toronto Hospital

**VAN DEUSEN Resigns**—Walter H. Van Deusen, director of sales and advertising of the Detroit Motor Car Co., has resigned.

**Willys-Overland to Build Fresno Branch**—The Willys-Overland Co. will erect a building at a cost of \$70,000 at Fresno, Cal., for sales and service purposes.

**Republic Truck to Double Capacity**—The Republic Motor Truck Co. will erect a large addition immediately to its plant at Alma, Mich., and will double production capacity.

**Chase Leaves Barley**—E. H. Chase has resigned as sales manager of the Barley Motor Car Co. to become the secretary and treasurer of the Perfection Sales Co., Indianapolis, Ind.

**Wilson Body Co. Plant Ready Soon**—The Wilson Body Co.'s plant, Bay City, Mich., construction of which recently started, is being rushed to completion and will be ready for occupancy by the first of August.

**Detroit Motor Appliance Adds Capital**—The Detroit Motor Appliance Co., owner of patents of damper used on the radiators of the Hudson and Columbia and other cars, has increased its capital from \$45,000 to \$225,000.

**New Maxwell Dealer on Coast**—Robert L. Alvies has been made the Maxwell distributor for northern California. The name of Mr. Alvies' company is the Western Motors Co. The company has contracted with the Maxwell Motor Co. for \$2,000,000 worth of Maxwells during the next twelve months.

**Enter Independent Foundry Co.**—The Independent Foundry Co., West Allis, Wis., has been organized to manufacture gray iron castings for the gas engine and other metal-working trades. Plans are being prepared for a foundry unit, 85 by 100 ft., with auxiliary buildings. The owners of the new company include August M. and Joseph Fonz, Joseph Budzinski, Frank Sprader and A. W. Tabbert.

**Boone Tire Installs Equipment**—Among the larger pieces of equipment to be installed in the new plant of the Boone Tire & Rubber Co., Sycamore, Ill., at Chippewa Falls, Wis., is a 150 hp. rotary calendar, weighing 75,000 lb. without drives or motors. Contracts for electric motors of an aggregate of more than 300 hp. have been awarded by the company. Work on the first structures is now under

way, and it is hoped to get the plant into operation by Aug. 15 or Sept. 1.

**Rockwell Becomes Standard G. S. M.**—F. S. Rockwell has been appointed general sales manager of the Standard Motor Truck Co.

**Jollie Becomes Ajax Supervisor**—R. T. Jollie, Jr., has been appointed supervisor of the Ajax Rubber Co. in Ohio, West Virginia and Kentucky.

**Globe Seamless Adds**—The Globe Seamless Steel Tube Co., Milwaukee, Wis., manufacturing a variety of motor car and cycle parts, is preparing to make improvements in its plant to cost between \$50,000 and \$100,000.

**Lininger to Manage Chalmers Zone**—William Lininger has been appointed a zone manager for the Chalmers Motor Co. Mr. Lininger formerly was assistant sales manager of the Mitchell Motors Co. of Racine, Wis.

**Fields Leaves Hupp for Liberty**—Joseph E. Fields, sales manager of the Hupp Motor Car Corp., has resigned to become manager of sales, advertising and service for the Liberty Motor Car Co. O. C. Hutchinson, supervisor of branches for the Hupp Motor Car Corp., has been promoted to the sales managership, succeeding Mr. Fields.

**Has Large Materials Stock**—The Reo Motor Car Co. has purchased enough materials to meet the company's needs up to January, 1918, and will this year turn out 100 per cent more trucks than in 1916 and 5000 more passenger cars than in the preceding twelve months. The company has orders on its books for more than 8000 passenger cars and many trucks.

**Lasure Clutch Co. Moves**—The Lasure Clutch Co., Madison, Wis., manufacturing friction clutches for gasoline engines of all kinds, has decided to move its plant and headquarters to Watertown, Wis., where local capital has taken a large block of stock and furnished a suitable factory building. The company is being reincorporated as the Lasure Friction Clutch Co. of Watertown, with a capital stock of \$60,000, of which \$20,000 is preferred and \$40,000 common stock. The removal of the works will be undertaken at once. The company will occupy the former

Dornfeld machine shop on Fifth Street and will employ from twenty-five to thirty workers at the start.

**McCulla Returns to England**—William R. McCulla, of the engineering staff of Willys-Overland Co., is returning to England to again enter army duties.

**Federal Rubber Extends Plant**—The Federal Rubber Co., Milwaukee, has awarded contracts for another large addition to its tire plant in Cudahy, Wis., to cost about \$75,000. The new building will be six stories high, 45 by 300 ft.

**Detroit Truck Makes Appointments**—Carl Jeffries has been appointed chief engineer of the Detroit Truck Co. Mr. Jeffries formerly was with the Lozier, Studebaker and Reo companies. Harry Peirce has been appointed purchasing agent of the company.

**Titan Motors Plant**—The Titan Motors Corp. has taken a portion of the Bour-Davis plant and placed a corps of draftsmen to work. A. A. Gloomer of the company reports excellent progress and states that a motor for trucks designed for the government is to be manufactured at the Titan plant.

**Peerless Makes Trucks for England**—The Peerless Motor Car Co. has completed extensions to be used for the manufacture of passenger cars and has commenced the erection of a warehouse, 48 by 400 ft. The motor truck department of the company is employed to about its full capacity in trucks for England at the rate of fifteen a day.

**Napoleon Is Reorganized**—The Napoleon Motor Car Co., of Napoleon, Ohio, it is stated, will locate its plant at Traverse City, Mich. The company has been reorganized with a capital of \$150,000. The company will have an initial capacity of three cars a day. O. A. George, who has been the active head of the concern, will remain in that capacity.

**Automatic Turns Out First Trailer**—The Automatic Control Trailer Co., Columbus, Ohio, which was incorporated about six weeks ago for \$25,000, has just turned out its first trailer, which has been sold to the Crystal Soda Water Co. Officers of the company are S. A. Kinnear, president; Charles Seaman, vice-president; John T. Price, secretary-treasurer.

**Buick Branch Managers' Convene**—Managers and distributors of thirty-six branches of the Buick Motor Co. in all parts of the United States representing more than 4000 Buick dealers held their annual meeting recently. Meetings included addresses by Walter P. Chrysler, president and general manager; H. H. Bassett, assistant general manager; and E. T. Strong, sales manager.

**Detroit Iron & Steel Expands**—The Detroit Iron & Steel Co. has declared a cash dividend of 1½ per cent on the company's preferred stock, payable July 16, to stockholders of record July 2. It has declared a 10 per cent dividend in cash payable in four installments of 2½ per cent each to the owners of common stock. The first payment is to be July 16 to stockholders of record July 2. The company will increase its authorized common stock from \$750,000 to \$1,500,000 by transfer of \$750,000 from accumulated earnings and that the new stock be issued to present owners of common stock in the form of a 100 per cent stock dividend. The new stock is to be issued July 2. When the operation is completed the company's outstanding capital stock will comprise \$750,000 of 7 per cent cumulative preferred and \$1,500,000 of common

stock both par value \$10. The company operates a large steel plant on Zug island at the mouth of the River Rouge.

**Shay Joins Highgrade Motors**—Lotte Shay has joined the Highgrade Motors Co. as production manager and assistant treasurer.

**Howe to Acason Truck**—H. H. Howe has been appointed sales manager of the Acason Motor Truck Co. Mr. Howe formerly was with the Maxwell Motor Co.

**St. Louis Trade Gives \$500**—A donation of \$500 to the Red Cross fund was authorized at a special meeting of the Board of Directors of the St. Louis Automobile Manufacturers' and Dealers' Association.

**Prest-O-Lite to Double Branch**—The Milwaukee, Wis., branch of the Prest-O-Lite Co., Indianapolis, is to be doubled in size at once. The addition will be of reinforced concrete construction, 60 by 127 ft. in size. The company also maintains a large plant in Milwaukee.

**Warner Gear to Sell Groceries**—The Warner Gear Co., of Muncie, Ind., has announced plans for the establishing of a grocery for the exclusive use of employees. A full line will be carried, and the goods will be sold to employees at cost. An expert will be employed to take charge of the department.

**Cleveland-Packard to Extend Building**—The Packard Motor Car Co. of Cleveland has purchased a lease on a plat 50 by 200 ft. adjoining its present location, and will build on it. When this is finished the Packard-Cleveland company's headquarters will represent an investment of \$425,000 in buildings.

**Field Motor May Move**—The Field Motor Co., Grand Rapids, Mich., is contemplating the removal of its factory and offices to Belding, Mich. The company states it is now beyond the experimental stage and has orders on hand for \$500,000 worth of engines for tractors, including a large order from the Chandler & Taylor Co., Indianapolis, Ind.

**Gibney Tire Settlement Delayed**—At a meeting of the creditors of the Gibney Tire & Rubber Co., Conshohocken, Pa., recently, an offer of settlement was submitted by the company on a basis of 45 per cent. Action on the offer was deferred pending further consideration of it. It developed that the Fisk Tire & Rubber Co. has made an offer of \$409,000 for the business.

**Triangle Motor Car Elects**—Officers and directors of the new Triangle Motor Car Co., St. Johns, Mich., were elected last week as follows: Directors, Eugene Hart, Fred Von Thurn, Walter Burk, Raymond Hull, Fred Burk, Henry Kelly, and Charles S. Clark; officers, Eugene Hart, president; Fred Von Thurn, general manager; Walter Burk, secretary, and Raymond Hull, treasurer.

**Body Polish Maker Reorganizes**—The Varni-Shine Co., which has been manufacturing a motor car body polish at Columbus, Ohio, is in process of reorganization, and headquarters will be located in Cleveland. James Price will be general manager, succeeding Mrs. C. C. Janes, who started the business and who retires because of ill health. The Columbus office will be retained.

**To Make Georgia Military Roads**—The Georgia State Automobile Association, with the co-operation of citizens of Griffin and Macon, has inaugurated a movement for the marking and improvement of the Dixie Highway between Atlanta and Macon. It is believed that this road is likely to assume a great deal of importance as a military highway, in view of the location of military camps at both Macon and Atlanta, and the location of the quartermaster's supply depot in the latter city. A similar movement is on between the Georgia State Automobile Association and the Chattanooga Automobile Club for the marking and improvement of both the Rome and the Dalton routes of the Dixie



**AMERICAN BANKER MAKES AMBULANCE GIFT**—This convoy of Ford ambulances was presented to the French army by H. H. Harjes, an American banker in Paris

Highway between Atlanta and Chattanooga for a military highway.

**Detroit Steel Plans Expansion**—A four-story factory building is to be erected for the Detroit Pressed Steel Co. Alterations are to be made upon three of its present plants.

**Johnston Becomes Grant Wheel Officer**—H. Scott Johnston has become vice-president and general sales manager of the Grant Wire Wheel Co. Mr. Johnston formerly was general manager of the Crow-Elkhart Sales Co.

**Forming New Wheel Company**—Promotion of a new company for the manufacture of demountable wheels is being completed at Grand Rapids, Mich. The company is to be known as the Kol-ben Mfg. Co. and will be capitalized at \$200,000. Stock will be offered at \$10 a share. The company will

manufacture hubs only for wire, wood or steel wheels.

**Old Reliable to Add**—The Old Reliable Motor Truck Co., Chicago, will build a two-story addition, 100 by 160 ft., to enlarge its plant.

**Smith to Represent Packard**—T. H. Smith has been appointed special representative for the Packard Motor Car Co. of New York. Mr. Smith formerly was a field representative for the Packard company.

**Froesch in U. S. Service**—Chas. Froesch, formerly chief draftsman for the Gillette Motors Co., Mishawaka, Ind., has become an inspector of U. S. airplanes and airplane engines in the Signal Service.

**Templar Begins Plant Construction**—The Templar Motor Corp. has commenced the erection of a one-story building, which will be the first unit of its plant. Manufacturing will commence in about thirty days.

**Crapo Resigns As Manager**—Clifford M. Crapo, manager of the Western Michigan Oakland and Western Michigan Motor Co., Grand Rapids, Mich., has withdrawn his interest in the organization and resigned as manager.

**Chevrolet Contributes to Red Cross**—The Chevrolet Motor Co. has authorized a contribution of \$100,000 to the Red Cross War Fund, to be subscribed by its several divisions at Flint, New York, Tarrytown, St. Louis, Bay City, Toledo, Fort Worth, and Oakland, Cal.

**Doble - Detroit Closes Contracts**—The Doble-Detroit Steam Motors Co. has closed a contract with W. L. Hughson, president of the Pacific Kissel-Kar branch of San Francisco, for 1000 cars and with the Sanders-Duffy Auto Co., of Fort Worth, Tex., for 500 cars.

**Maxwell Makes \$4,000,000 Contract**—The Maxwell Motor Sales Corp. has closed a contract with the John D. Williams Co. of New York for 6000 Maxwell motor cars valued at \$4,000,000. A large number of the cars will be shipped to points in South America, and the remainder will go to countries in the Orient.

**Star Motor Plant Is Sold**—The Star Motor Co.'s plant, Ann Arbor, Mich., has been sold to a group of local men who bid \$19,000 for the realty holdings and \$1,000 for the personal effects of the concern at a sale held this week. Following are the purchasers of the plant: Gottlob Luick, A. D. Groves, representing the estate of Frederick Kapp, E. D. Hiscock, William Jacobus, H. J. Abbott and W. H. L. Rhode.

## Coming Motor Events

### CONTESTS

—1917—

July	14—Rochester, N. Y., hill climb.
July	15—Missoula, Mont., track.
July	17-19—Intercity Reliability.
July	22—Anaconda, Mont., track.
July	23—Great Falls, Mont., track.
Aug.	5—Billings, Mont., track.
Aug.	17—Flemington, N. J., track.
*Sept.	3—Cincinnati, Ohio, speedway.
Sept.	3—Uniontown, Pa., speedway.
Sept.	3—Albuquerque, N. M., track.
Sept.	6—Red Bank, N. J., track.
Sept.	8—Pike's Peak, Colo., hill climb.
*Sept.	15—Providence, R. I., speedway.
Sept.	23—Trenton, N. J., track.
*Sept.	29—New York, speedway.
Oct.	6—Uniontown, Pa., speedway.
Oct.	6—Danbury, Conn., track.
*Oct.	13—Chicago, speedway.
Oct.	13—Richmond, Va., track.
Oct.	27—New York, speedway.

\* A. A. A. Championship Award Event.

### SHOWS

Aug.	6-18—Fremont, Neb., tractor demonstration.
Sept.	9-15—Spokane, Wash., interstate fair.
Sept.	2-9—Milwaukee show, State Park fair, West Allis.
Oct.	13-28—Dallas, Tex., state fair.